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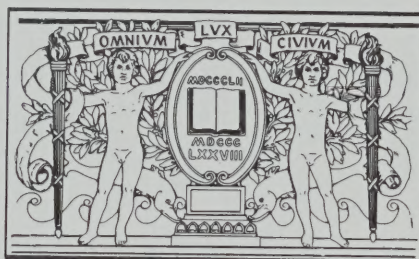
76/2

V. 4-2

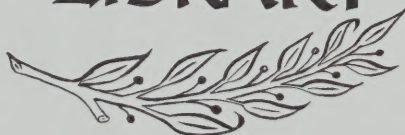
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SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-3
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
NO ARTERIAL STREET

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- " " (67 Decibels)
- " " (72 Decibels)

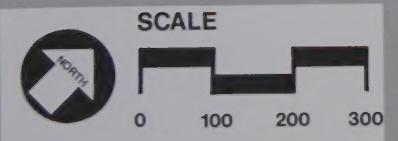
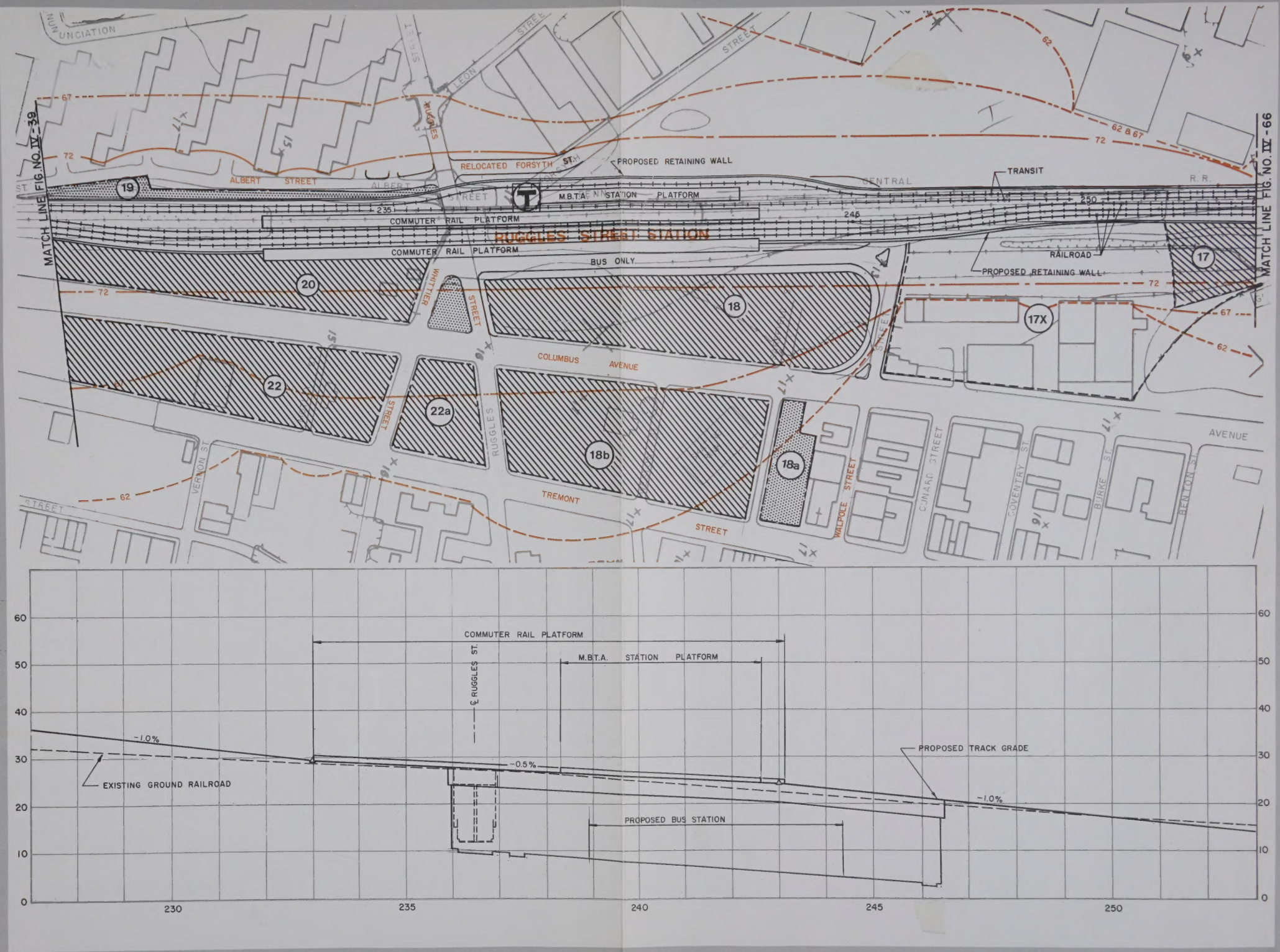


FIGURE
IV-40

FREDERIC R. HARRIS INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS






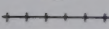

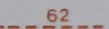

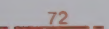
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  NOISE CONTOUR (62 Decibels)
-  II II (67 Decibels)
-  II II (72 Decibels)

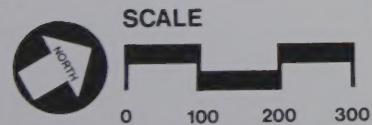
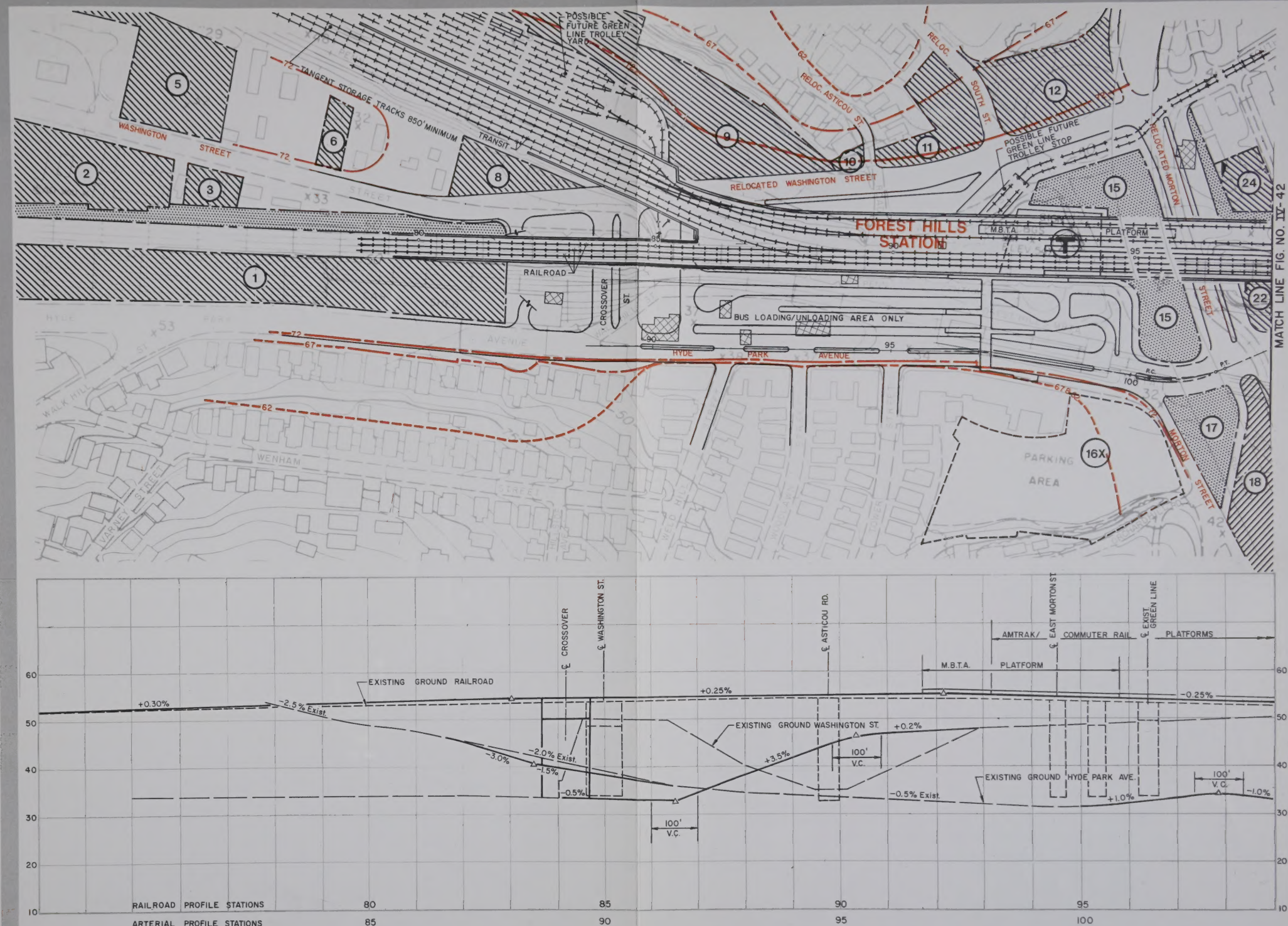


FIGURE
IV-41

FREDERIC R. HARRIS INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

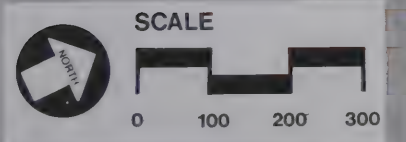
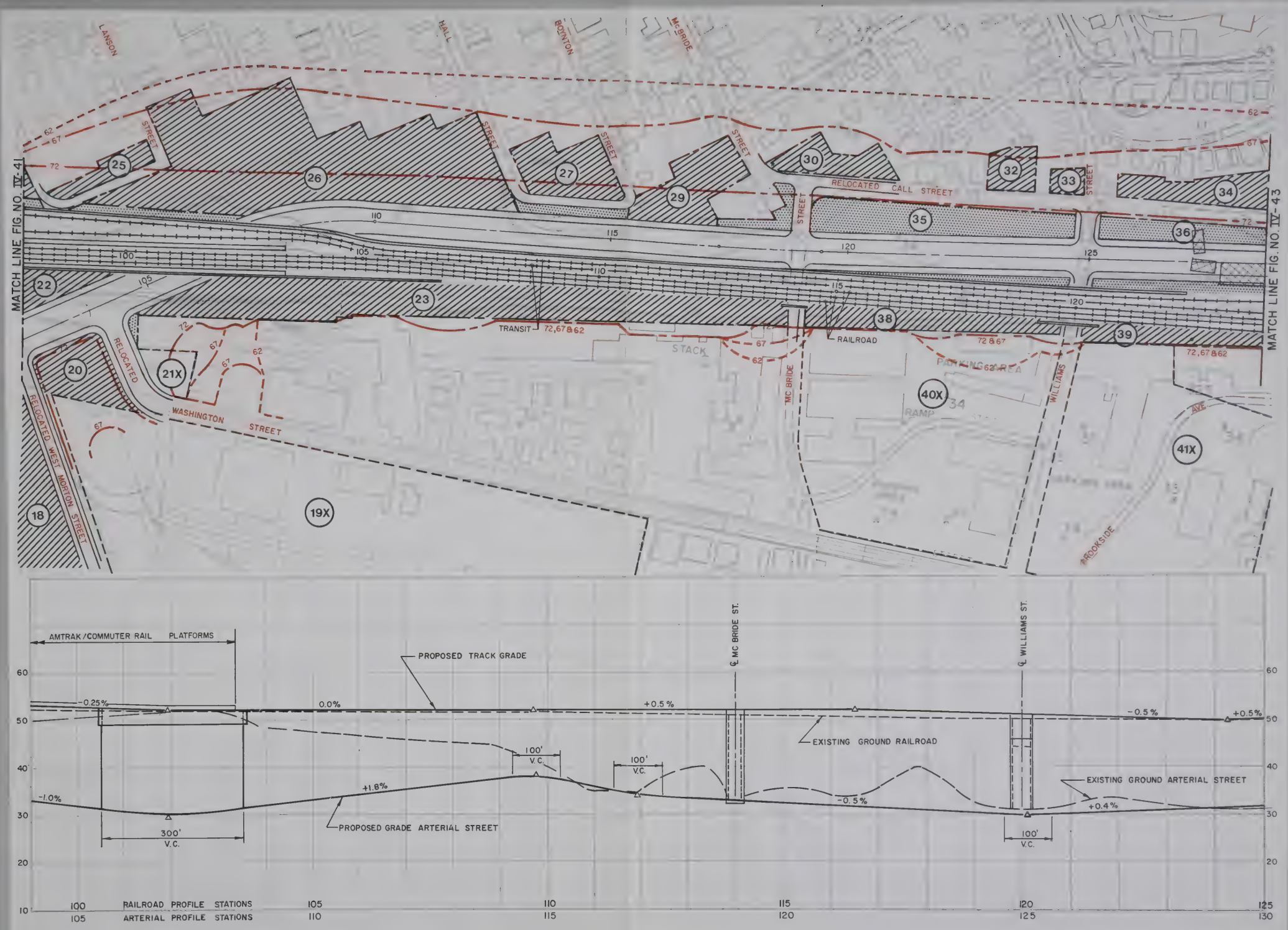


FIGURE
IV-42



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

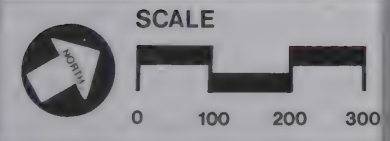
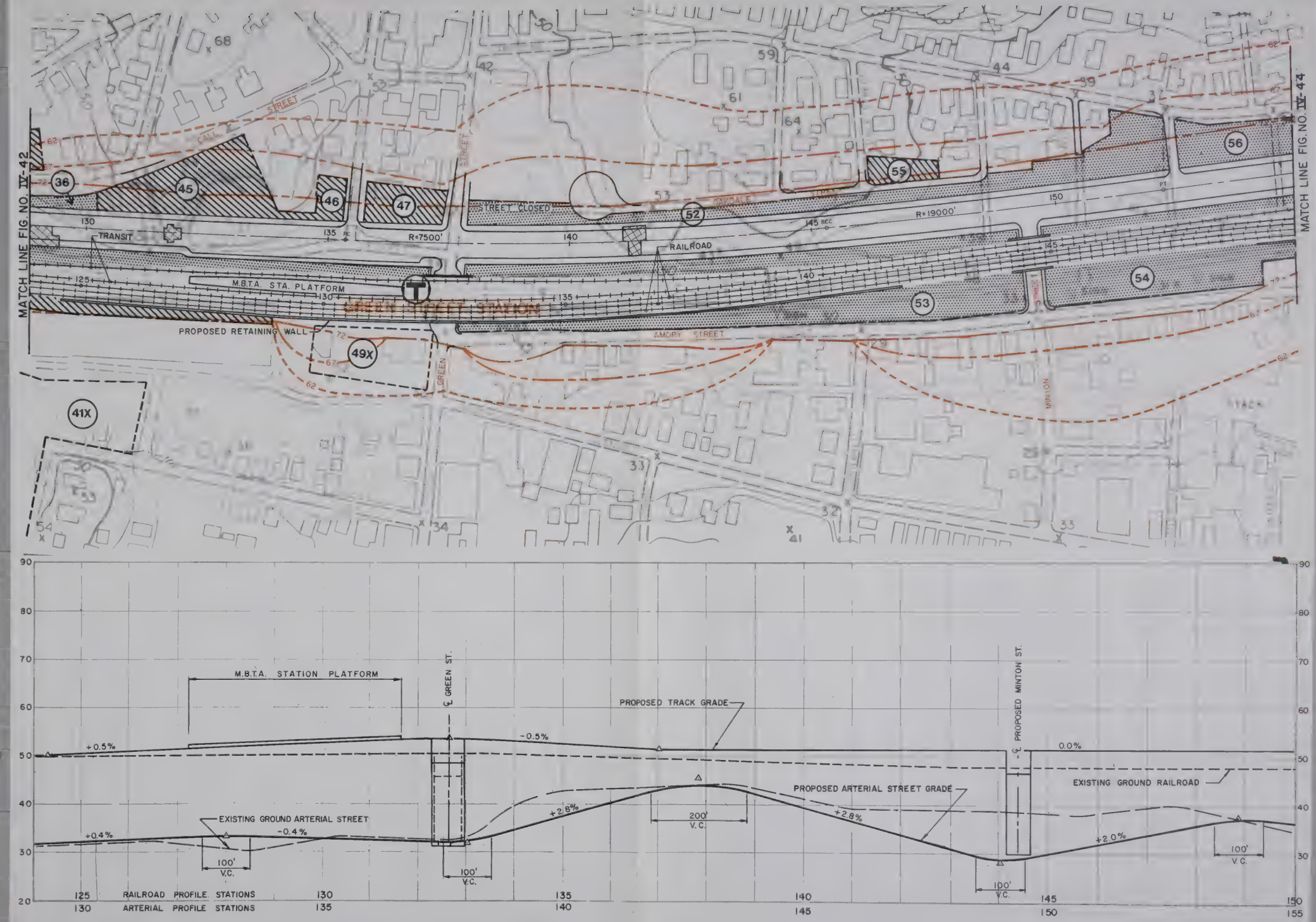


FIGURE
IV-43



BY ERIC R. HARRIS INC.

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

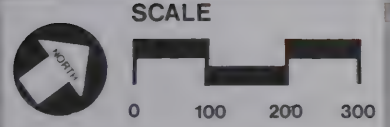
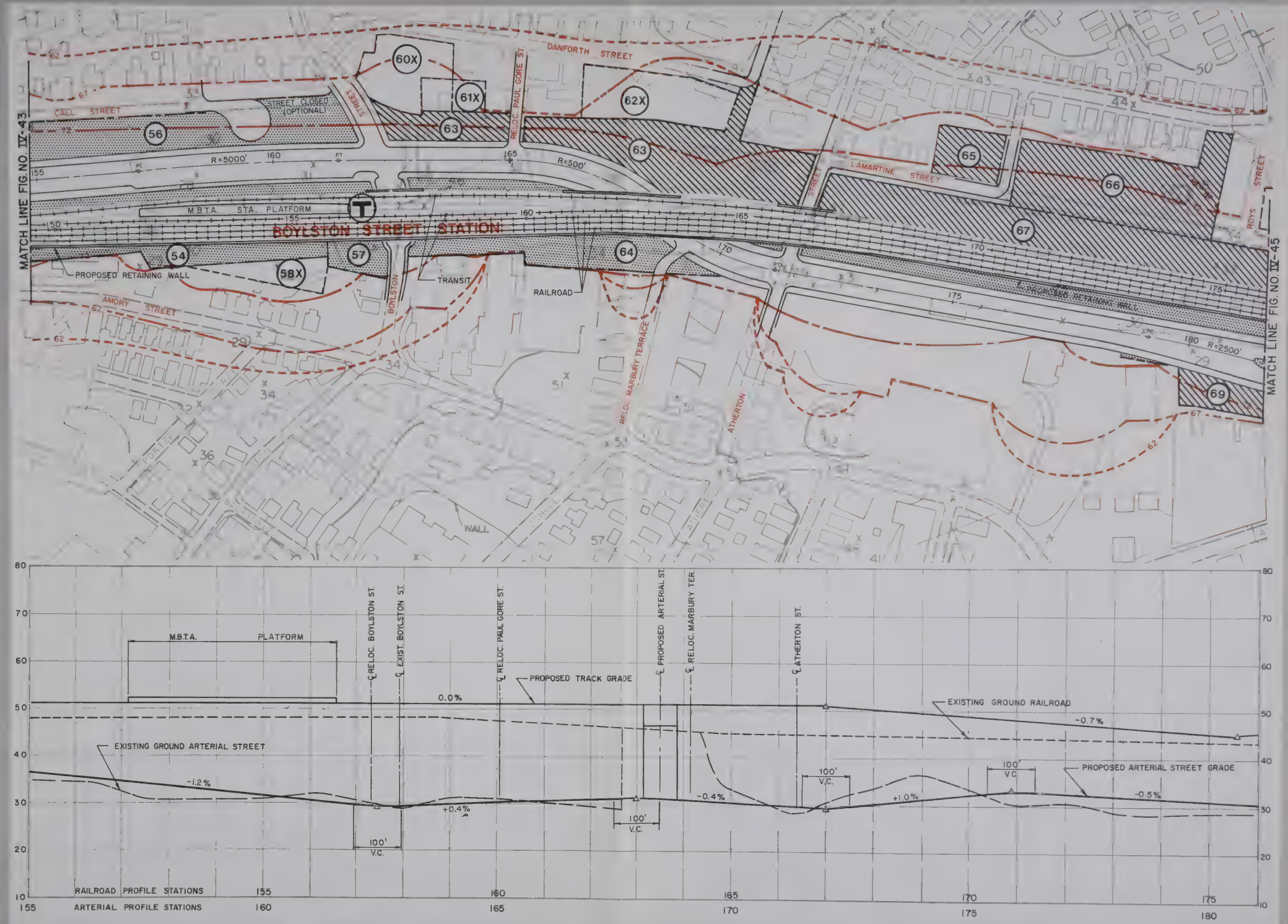


FIGURE
IV-44



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

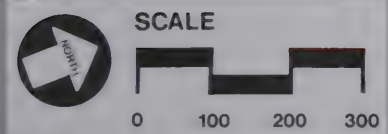
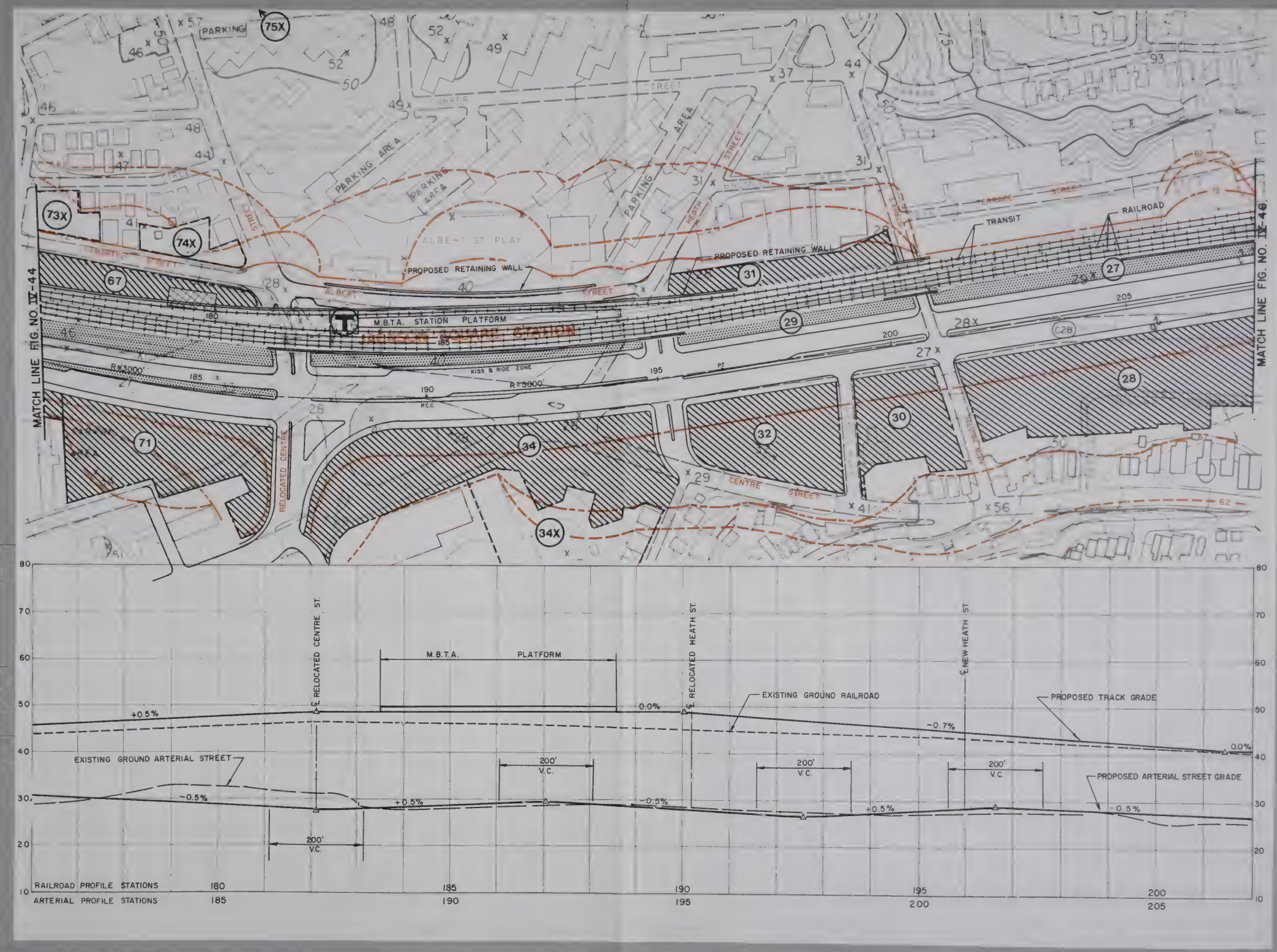


FIGURE
IV-45

FREDERIC R. HARRIS INC



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

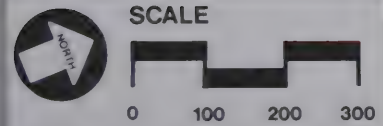


FIGURE
IV-45A



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

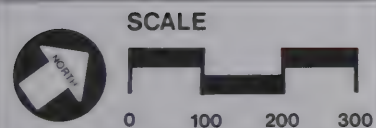
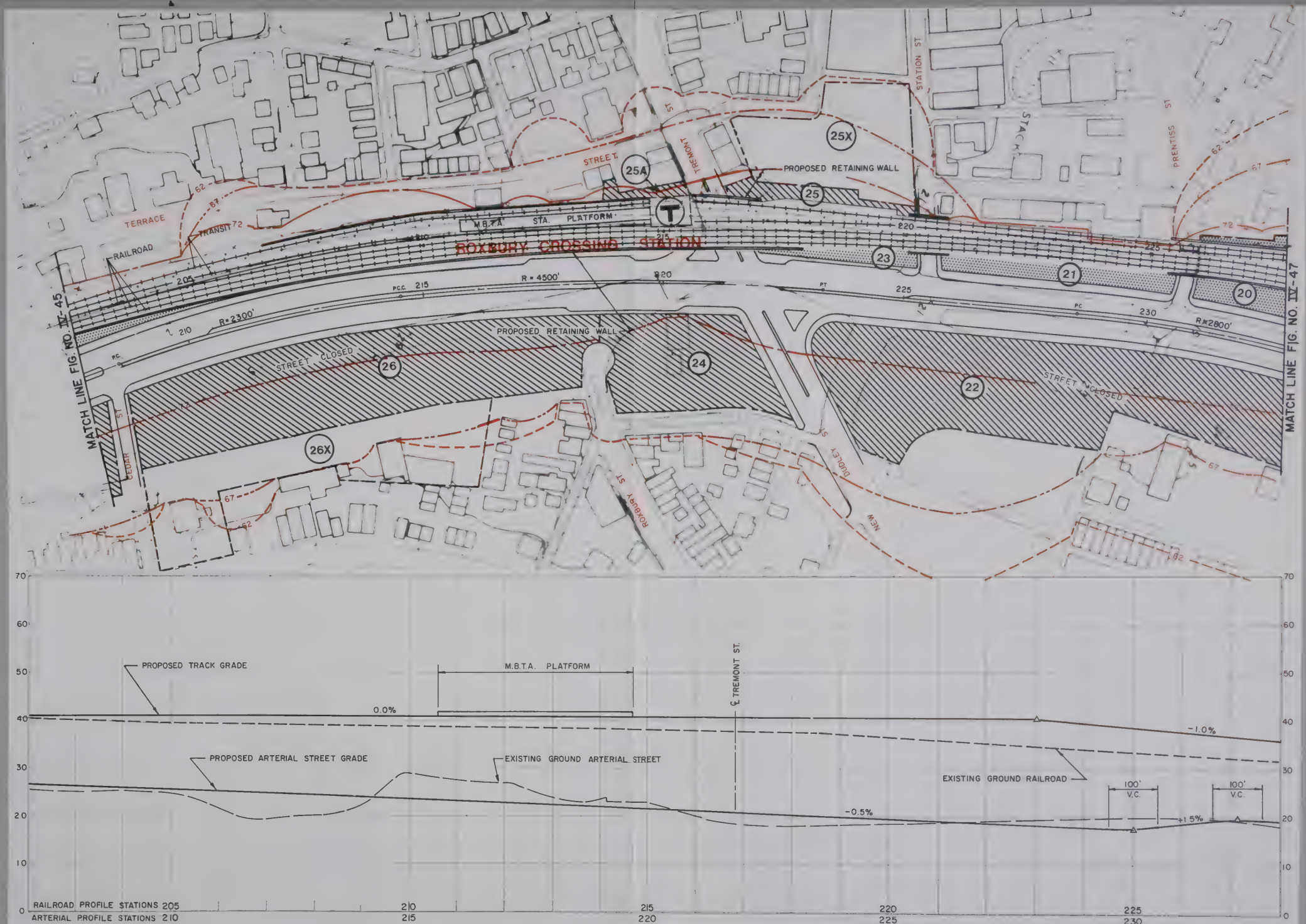


FIGURE
IV-46

FREDERIC R. HARRIS INC



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS





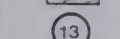
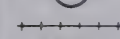

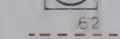


MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-4
(CAMDEN STREET to FOREST HILLS)

RAIL / TRANSIT
ON MODIFIED EMBANKMENT
RAIL ARTERIAL STREET
CROSSING EAST to WEST

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  NOISE CONTOUR (62 Decibels)
-  " " " (67 Decibels)
-  " " " (72 Decibels)

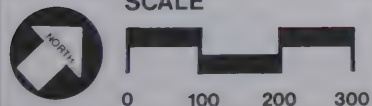


FIGURE
IV-47

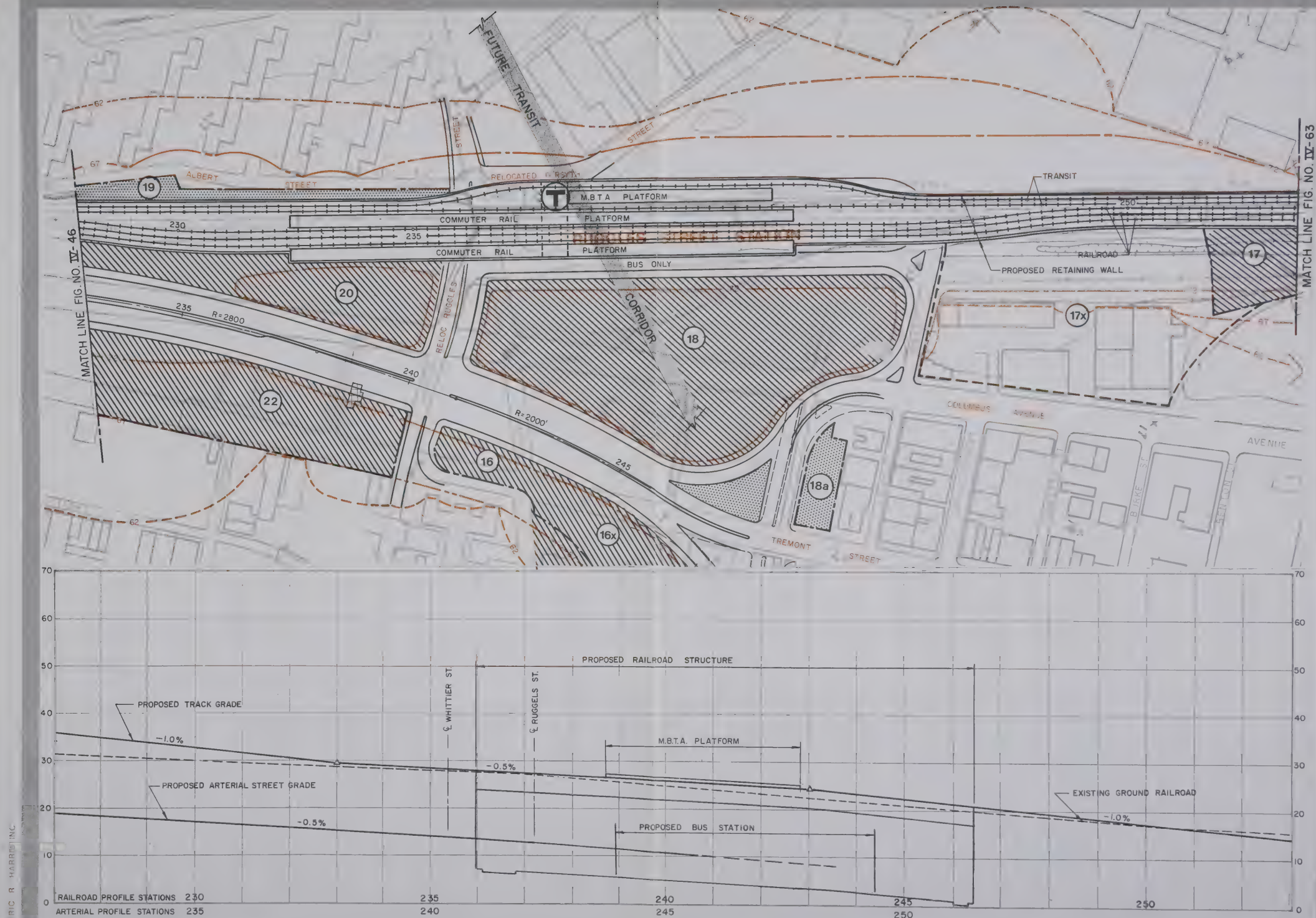


FIGURE IV-47

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**
**ENVIRONMENTAL
IMPACT ANALYSIS**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

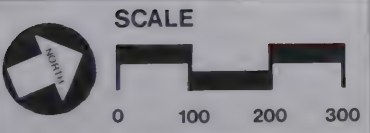
PLAN & PROFILE

ALTERNATIVE FH-5
(CAMDEN STREET to FOREST HILLS)

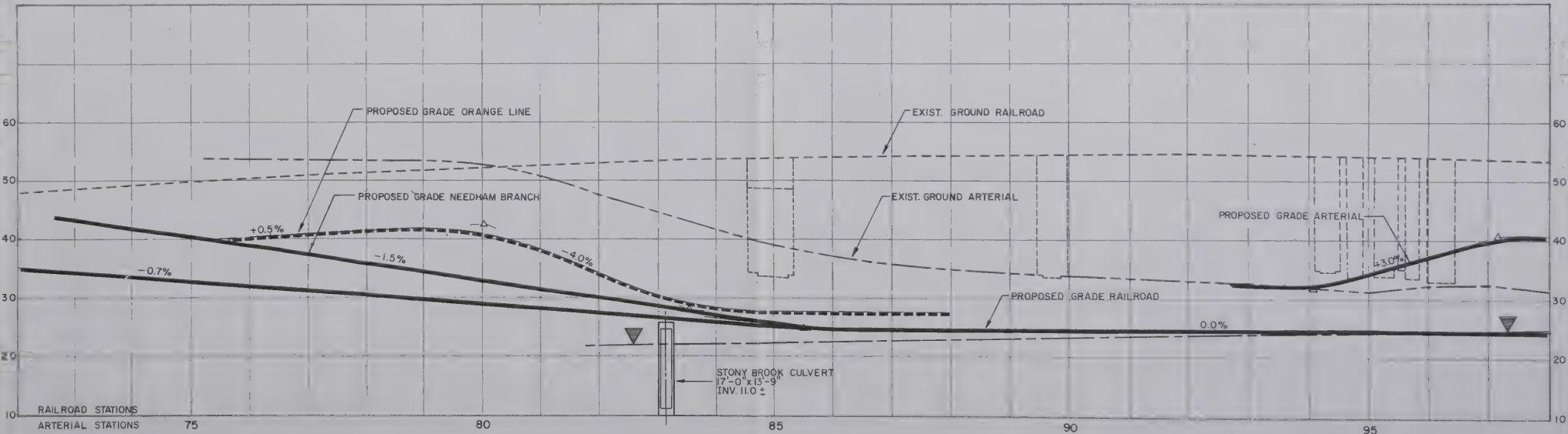
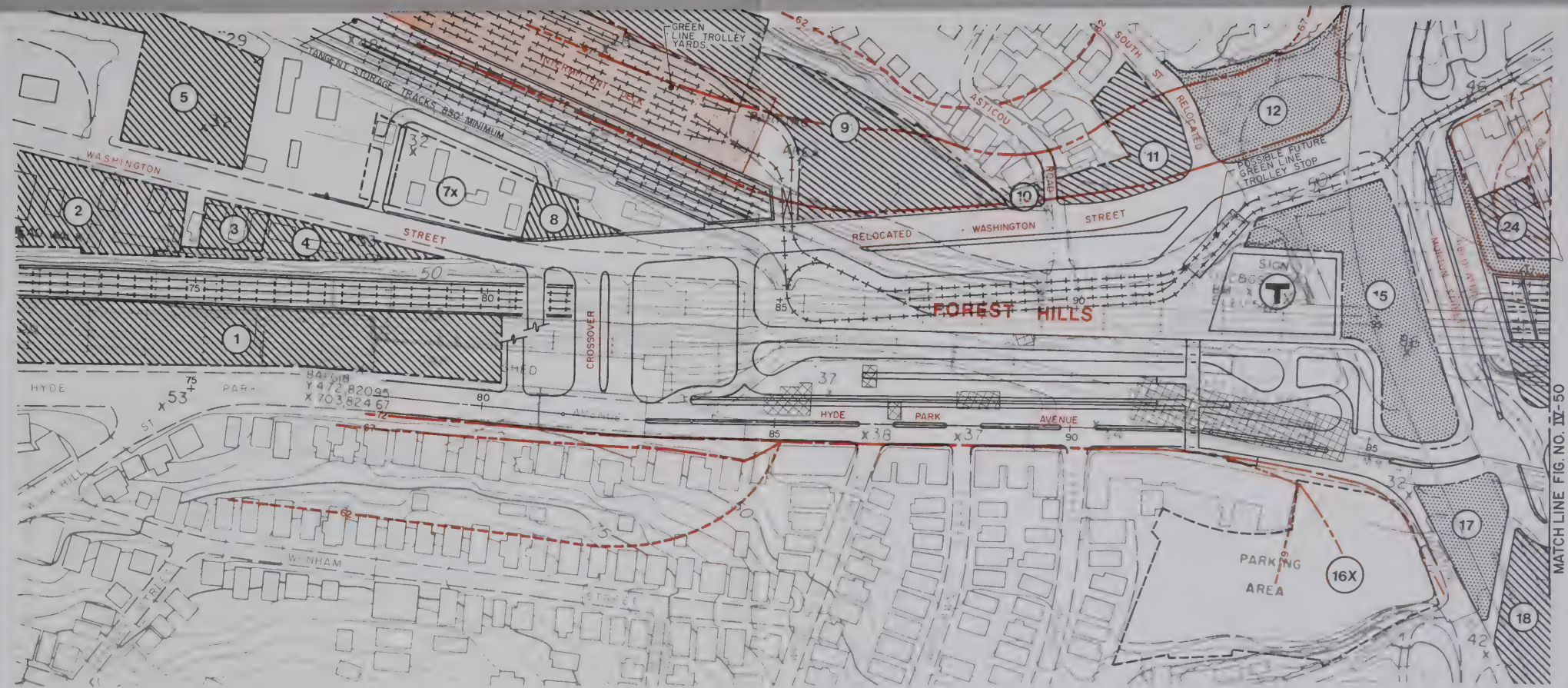
**MODIFIED
DEPRESSED RAIL / TRANSIT
ARTERIAL STREET EAST**

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- " " (67 Decibels)
- " " (72 Decibels)



**FIGURE
IV-49**



MATCH LINE FIG. NO. IV-50

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS















PLAN & PROFILE

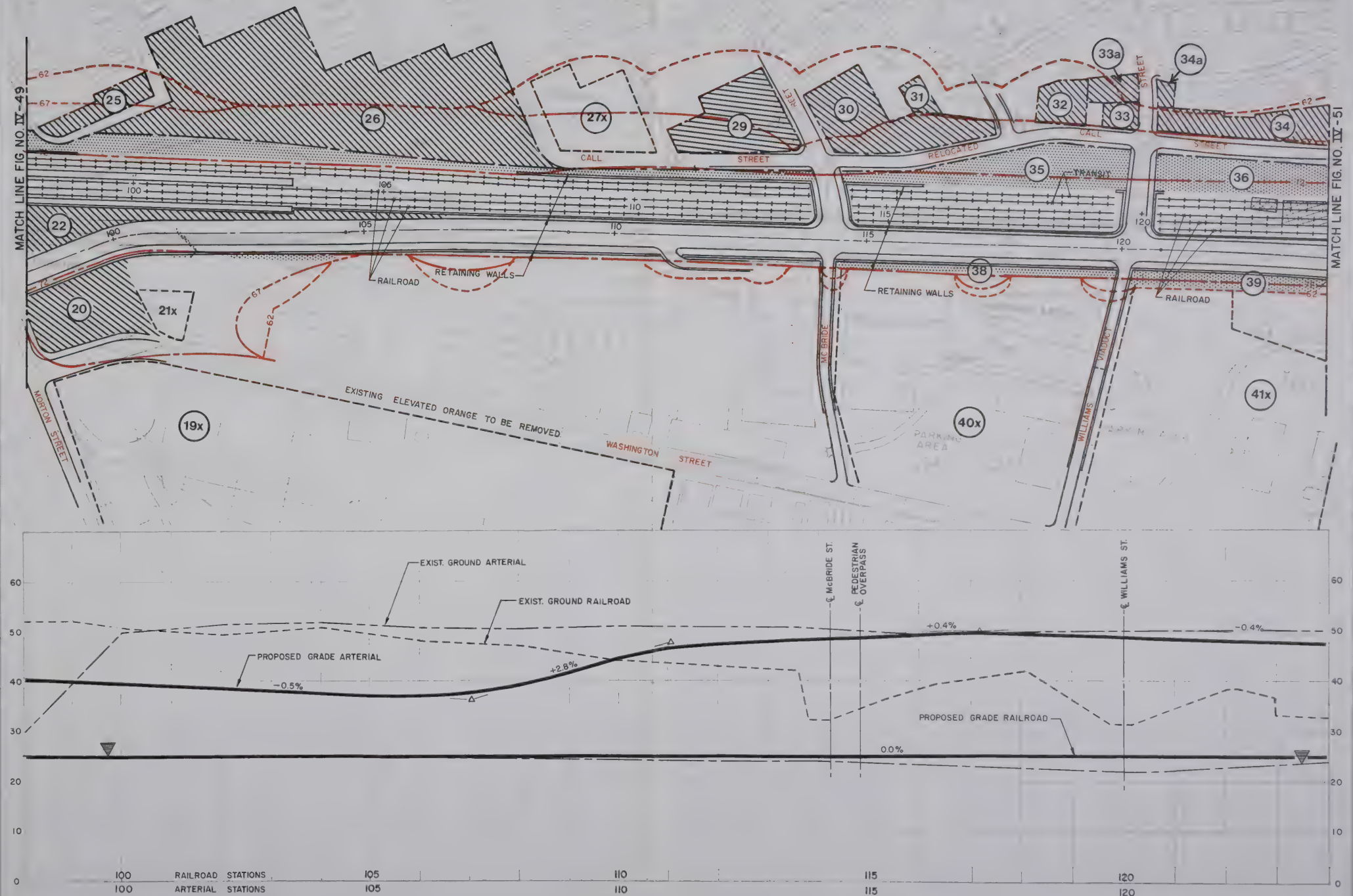
ALTERNATIVE FH-5

(CAMDEN STREET to FOREST HILLS)

MODIFIED DEPRESSED RAIL / TRANSIT ARTERIAL STREET EAST

LEGEND

- | | | |
|---|---|---|
|  | REDEVELOPMENT PARCELS | |
|  | OPEN SPACE REDEVELOPMENT | |
|  | POTENTIAL REDEVELOPMENT
(BY OTHERS) | |
|  | BUILDINGS TO BE REMOVED | |
|  | PARCEL NUMBER | |
|  | M.B.T.A. & RAILROAD TRACK | |
|  | PROPOSED STATIONS | |
|  | NOISE CONTOUR (62 Decibels) | |
|  |  | 
(67 Decibels) |
|  |  | 
(72 Decibels) |



FREDERIC R. HARRIS INC.











ENVIRONMENTAL IMPACT ANALYSIS

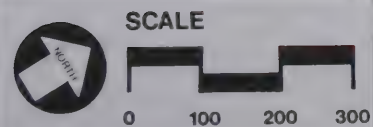
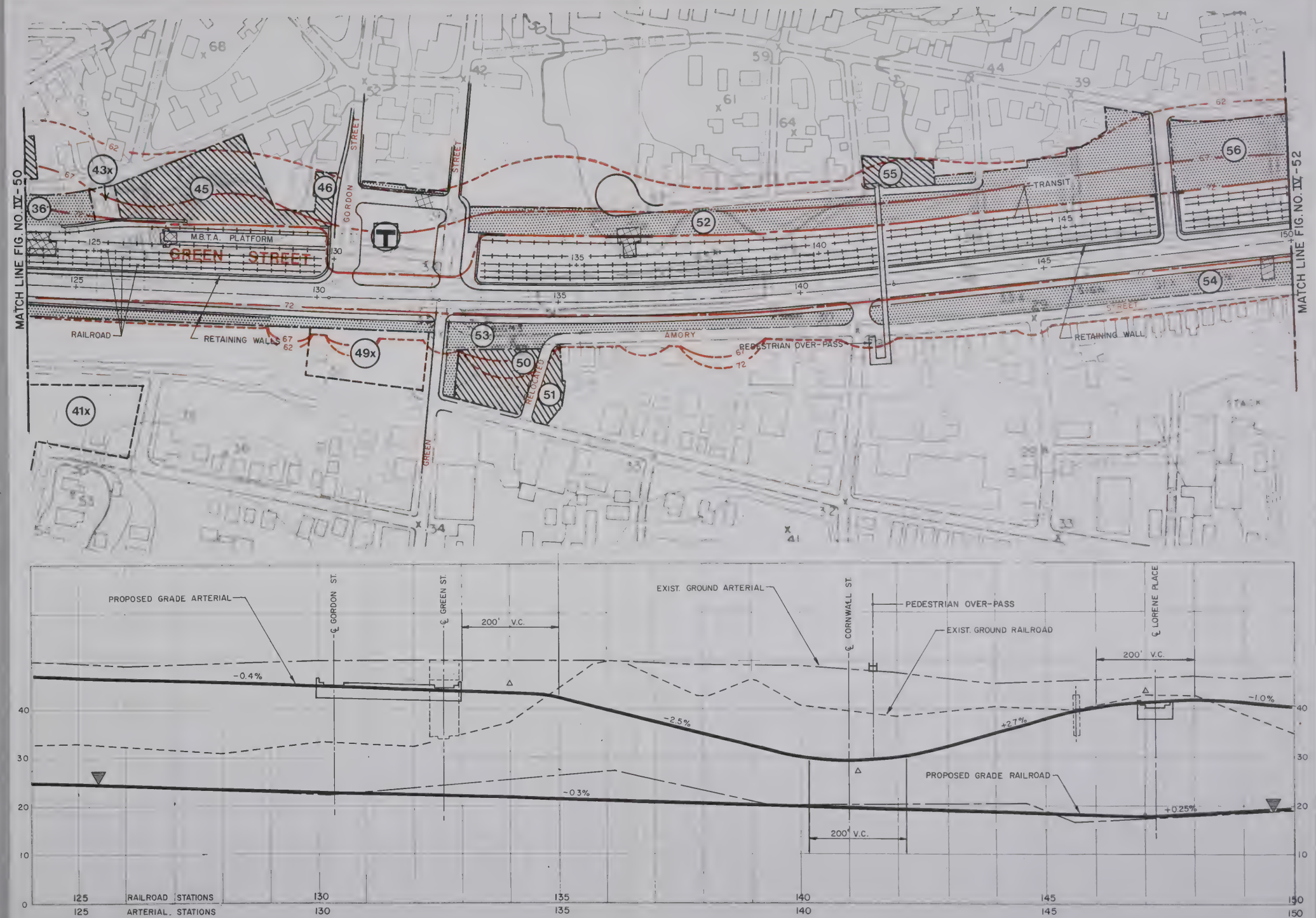
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MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ALTERNATIVE FH-5

(CAMDEN STREET to FOREST HILLS)

LEGEND

- | | |
|---|--|
|  | REDEVELOPMENT PARCELS |
|  | OPEN SPACE REDEVELOPMENT |
|  | POTENTIAL REDEVELOPMENT
(BY OTHERS) |
|  | BUILDINGS TO BE REMOVED |
|  | PARCEL NUMBER |
|  | M.B.T.A. & RAILROAD TRACK |
|  | PROPOSED STATIONS |
|  | NOISE CONTOUR (62 Decibels) |
|  | II II (67 Decibels) |
|  | II II (72 Decibels) |

FIGURE
IV-51

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS








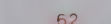
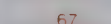

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-5
(CAMDEN STREET to FOREST HILLS)

MODIFIED
DEPRESSED RAIL / TRANSIT
ARTERIAL STREET EAST

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  NOISE CONTOUR (62 Decibels)
-  " " " (67 Decibels)
-  " " " (72 Decibels)

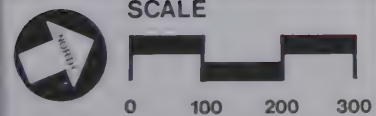
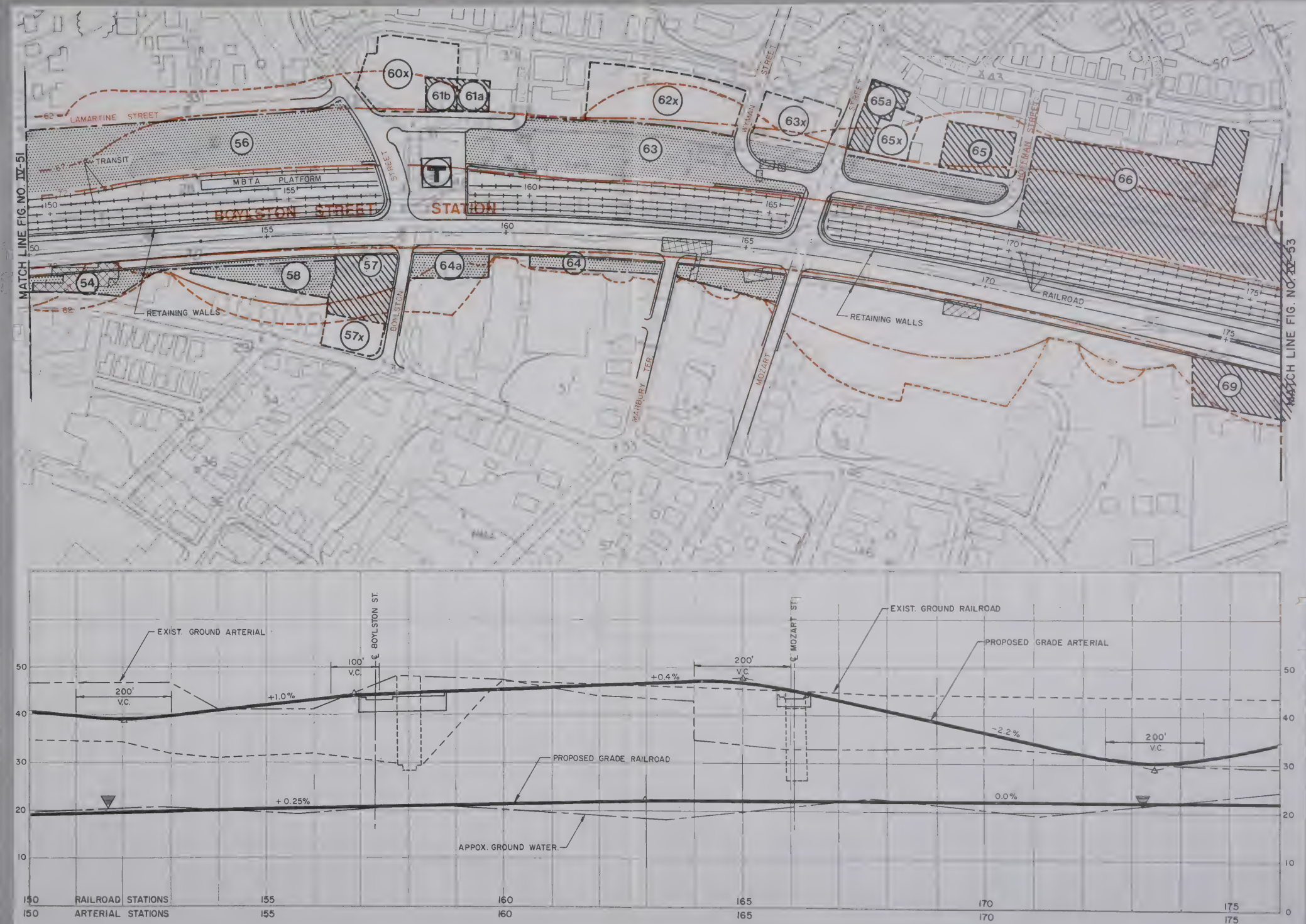


FIGURE
IV-52

FREDERIC R. HARRIS, INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-5
(CAMDEN STREET to FOREST HILLS)

MODIFIED
DEPRESSED RAIL / TRANSIT
ARTERIAL STREET EAST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- " " " (67 Decibels)
- " " " (72 Decibels)

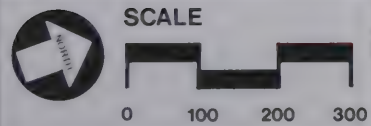
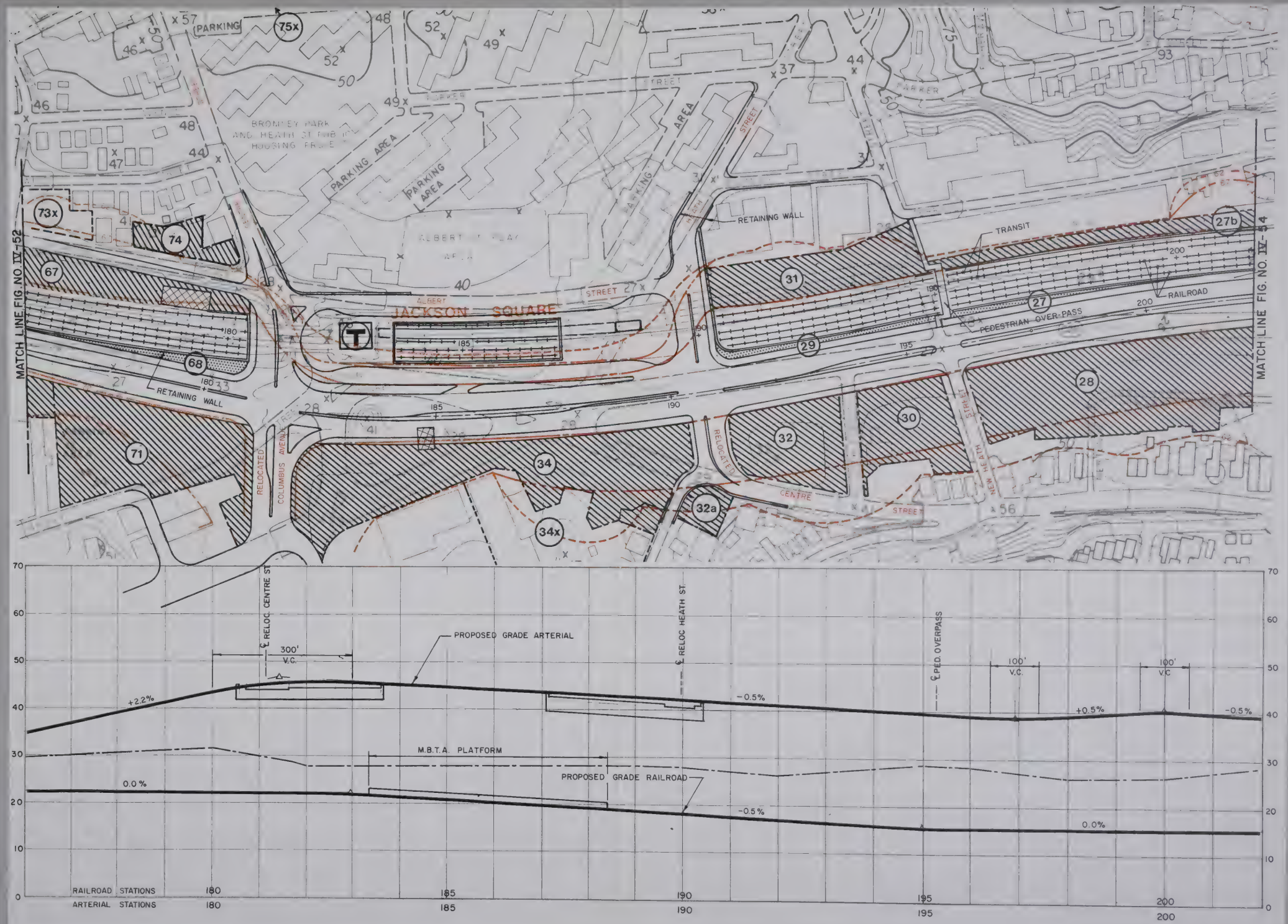


FIGURE
IV-53



FREDERIC R. HARRIS INC.

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-5
(CAMDEN STREET to FOREST HILLS)

MODIFIED
DEPRESSED RAIL / TRANSIT
ARTERIAL STREET EAST

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)



FIGURE
IV-54

FREDERIC R. HARRIS, INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS






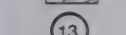
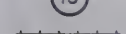


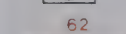
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-5
(CAMDEN STREET to FOREST HILLS)

MODIFIED DEPRESSED RAIL / TRANSIT ARTERIAL STREET EAST

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  NOISE CONTOUR (62 Decibels)
-  " " " (67 Decibels)
-  " " " (72 Decibels)

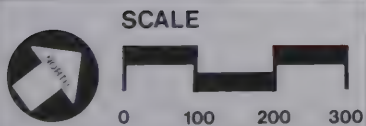
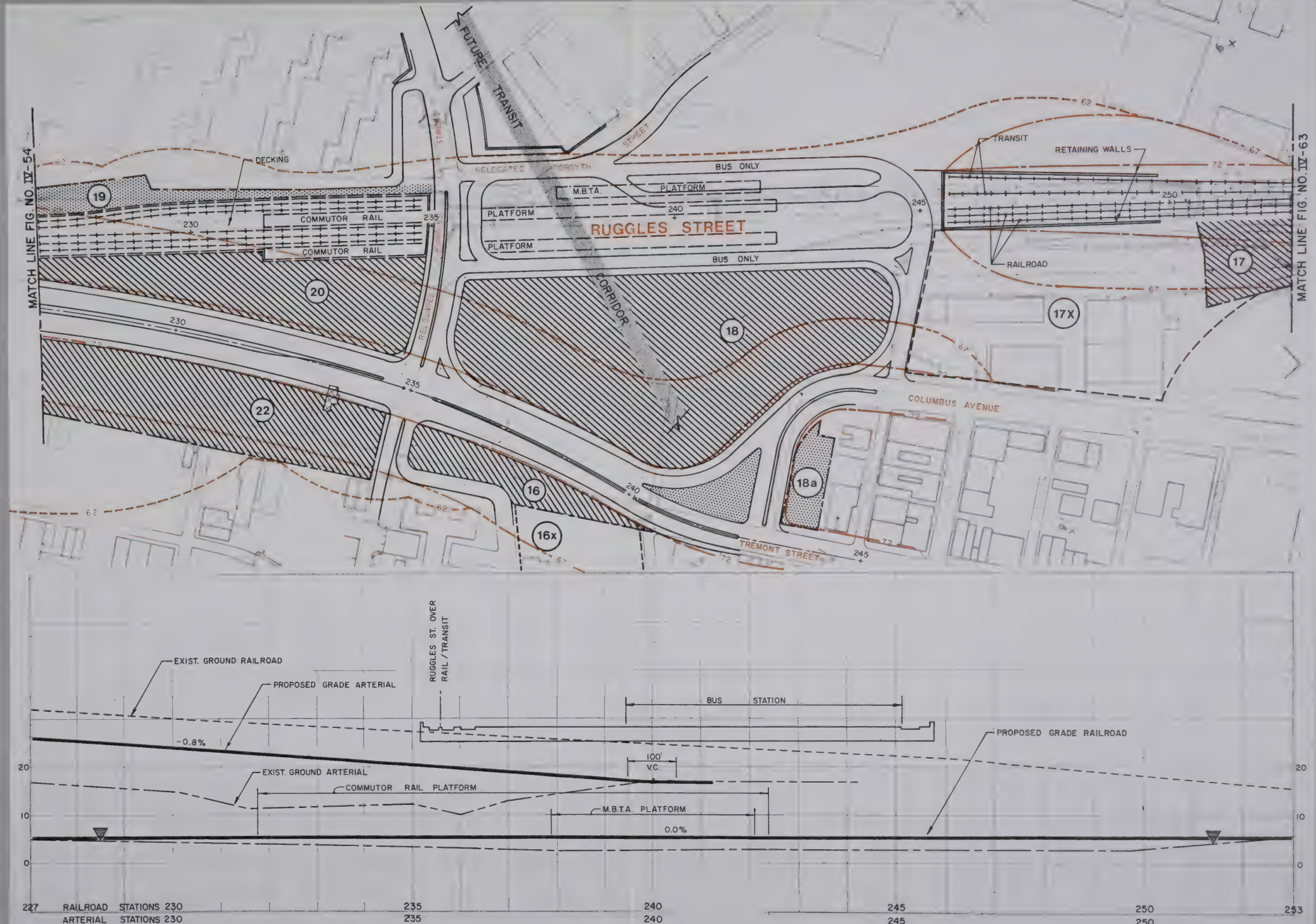


FIGURE
IV-55



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

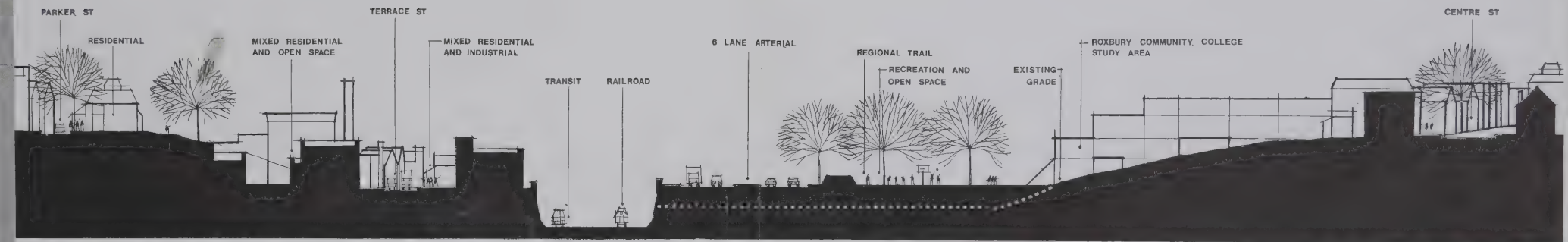
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ILLUSTRATIVE SECTIONS

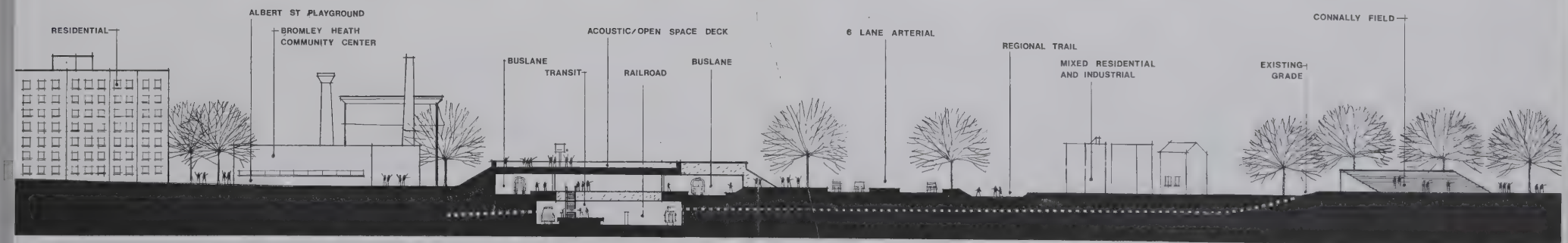
SOUTH END
ROXBURY
TRACKS MODIFIED DEPRESSED
ARTERIAL EAST



CARTER PLAYGROUND AT CAMDEN STREET FH5



ROXBURY AT CEDAR STREET FH5



ALBERT STREET PLAYGROUND AT JACKSON SQUARE FH5

SCALE



FIGURE

IV-55A

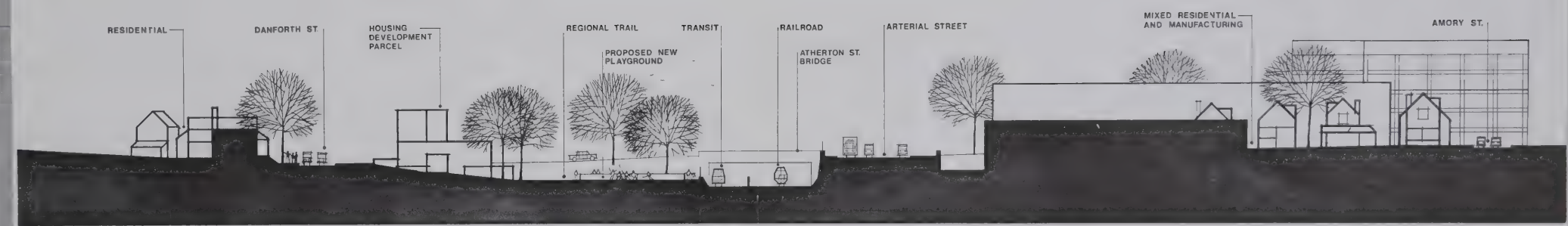
**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

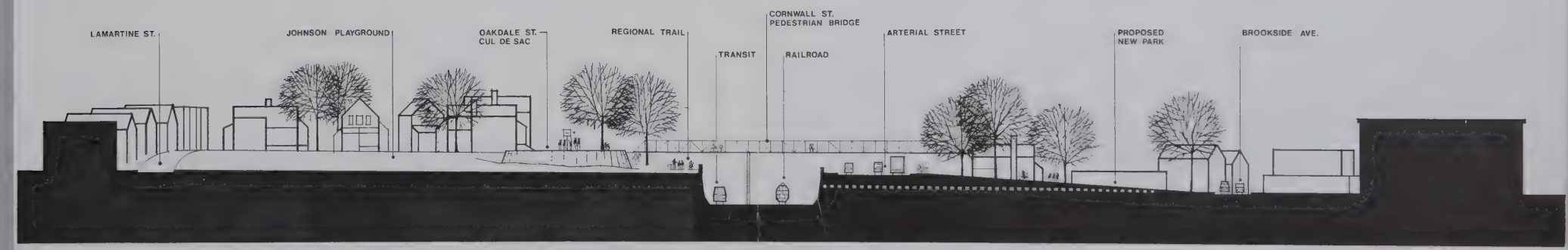
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**ILLUSTRATIVE
SECTIONS**

**JAMAICA PLAIN
TRACKS MODIFIED DEPRESSED
ARTERIAL EAST**

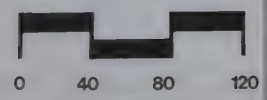


PROPOSED NEW PLAYGROUND AT BOYLSTON STATION FH5



JOHNSON PLAYGROUND AT GREEN STATION FH5

SCALE



FIGURE

IV-55B

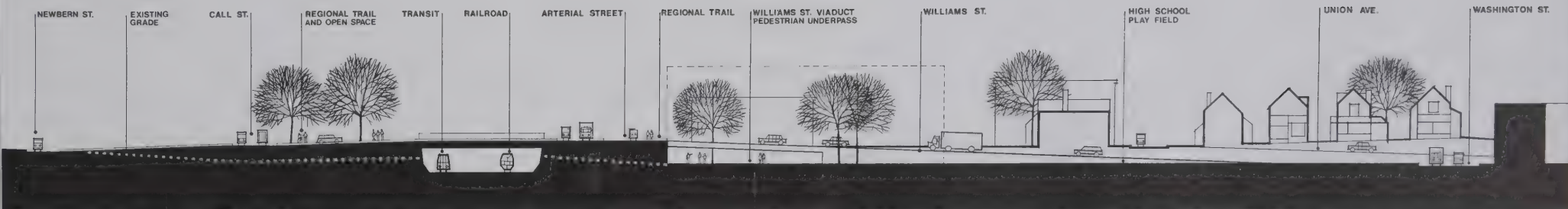
**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

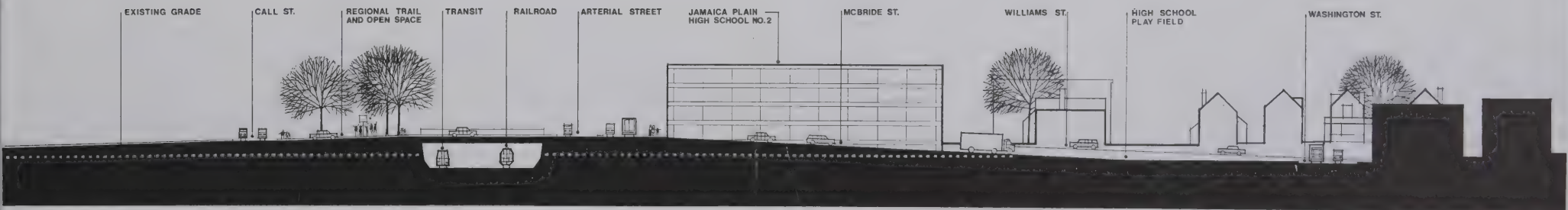
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**ILLUSTRATIVE
SECTIONS**

**JAMAICA PLAIN
TRACKS MODIFIED DEPRESSED
ARTERIAL EAST**



WILLIAMS STREET FH5



MCBRIDE STREET FH5

SCALE



FIGURE

IV-55C

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS








MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-6
(CAMDEN STREET to FOREST HILLS)

MODIFIED
DEPRESSED RAIL / TRANSIT
NO ARTERIAL

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS

--- 62 --- NOISE CONTOUR (62 Decibels)
--- 67 --- " " (67 Decibels)
--- 72 --- " " (72 Decibels)

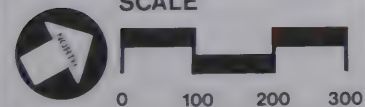
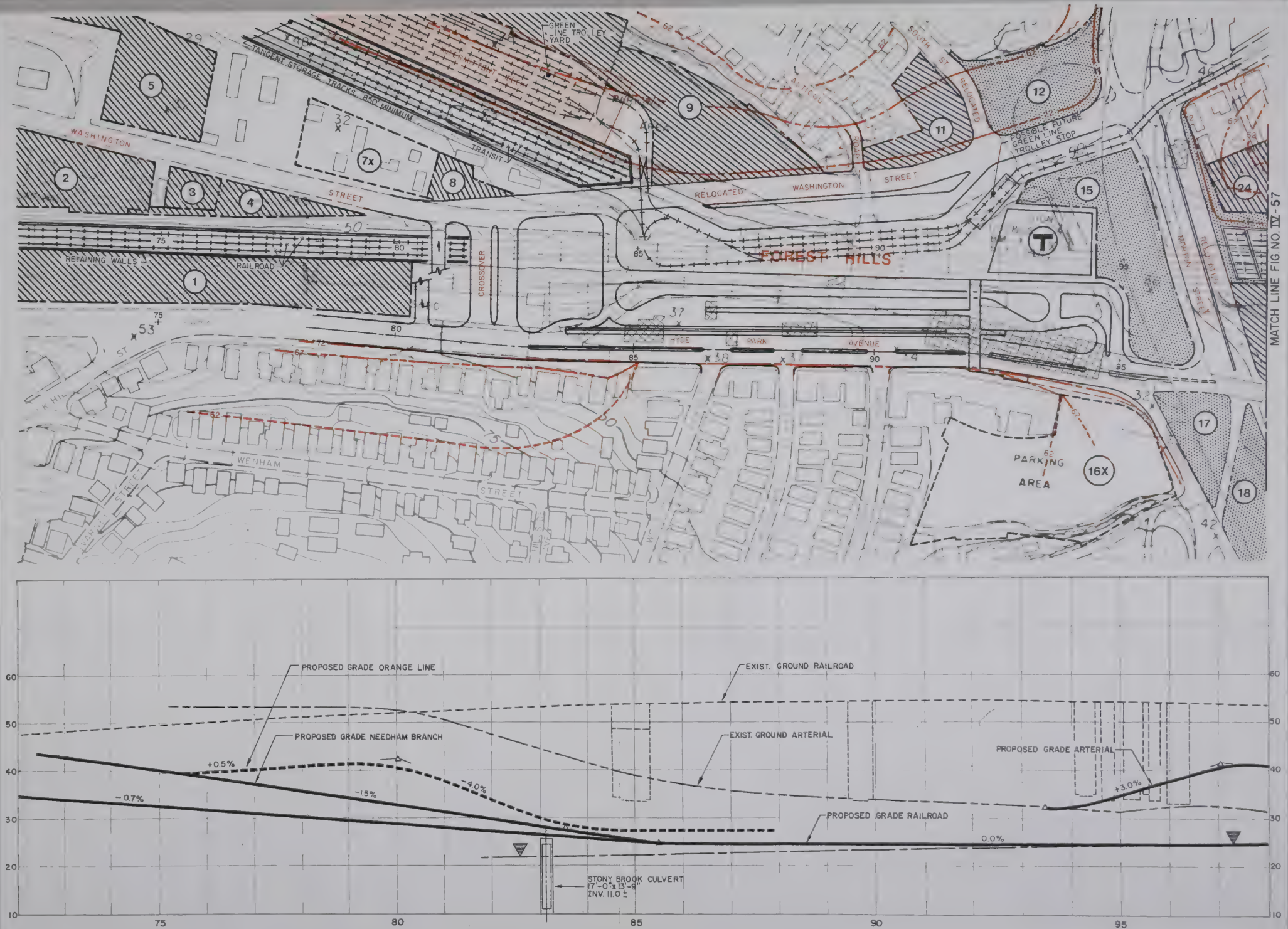


FIGURE
IV-56



MATCH LINE FIG. NO. IV-57

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**










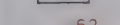
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

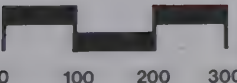
ALTERNATIVE FH-6
(CAMDEN STREET to FOREST HILLS)

**MODIFIED
DEPRESSED RAIL / TRANSIT
NO ARTERIAL**

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  62 NOISE CONTOUR (62 Decibels)
-  67 " (67 Decibels)
-  72 " (72 Decibels)

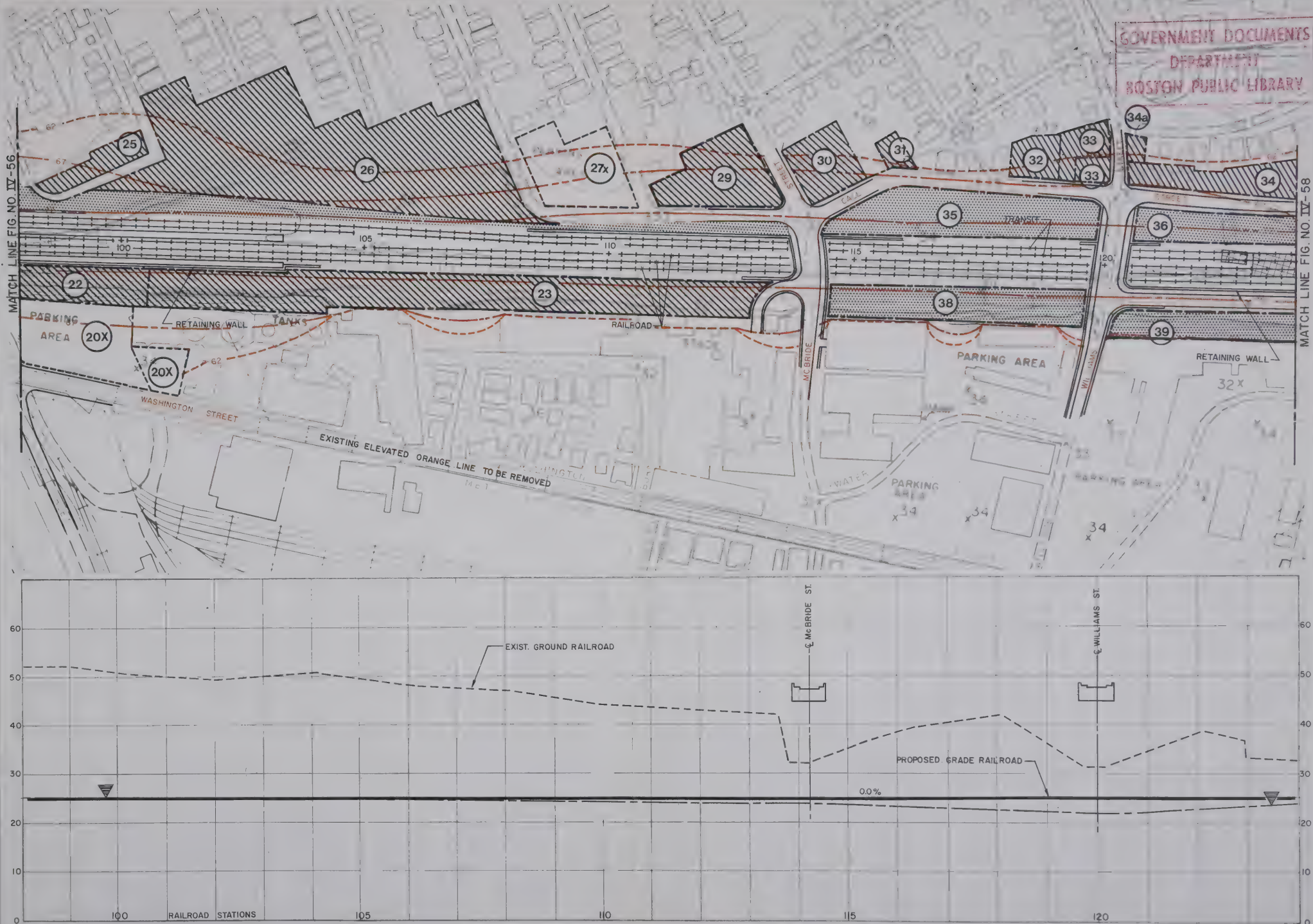
SCALE



FIGURE

IV-57

FREDERIC R. HARRIS, INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS





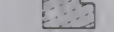
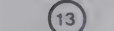


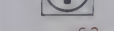

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-6
(CAMDEN STREET to FOREST HILLS)

MODIFIED
DEPRESSED RAIL / TRANSIT
NO ARTERIAL

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  NOISE CONTOUR (62 Decibels)
-  " " (67 Decibels)
-  " " (72 Decibels)

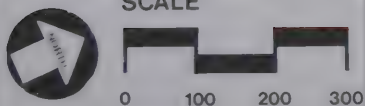
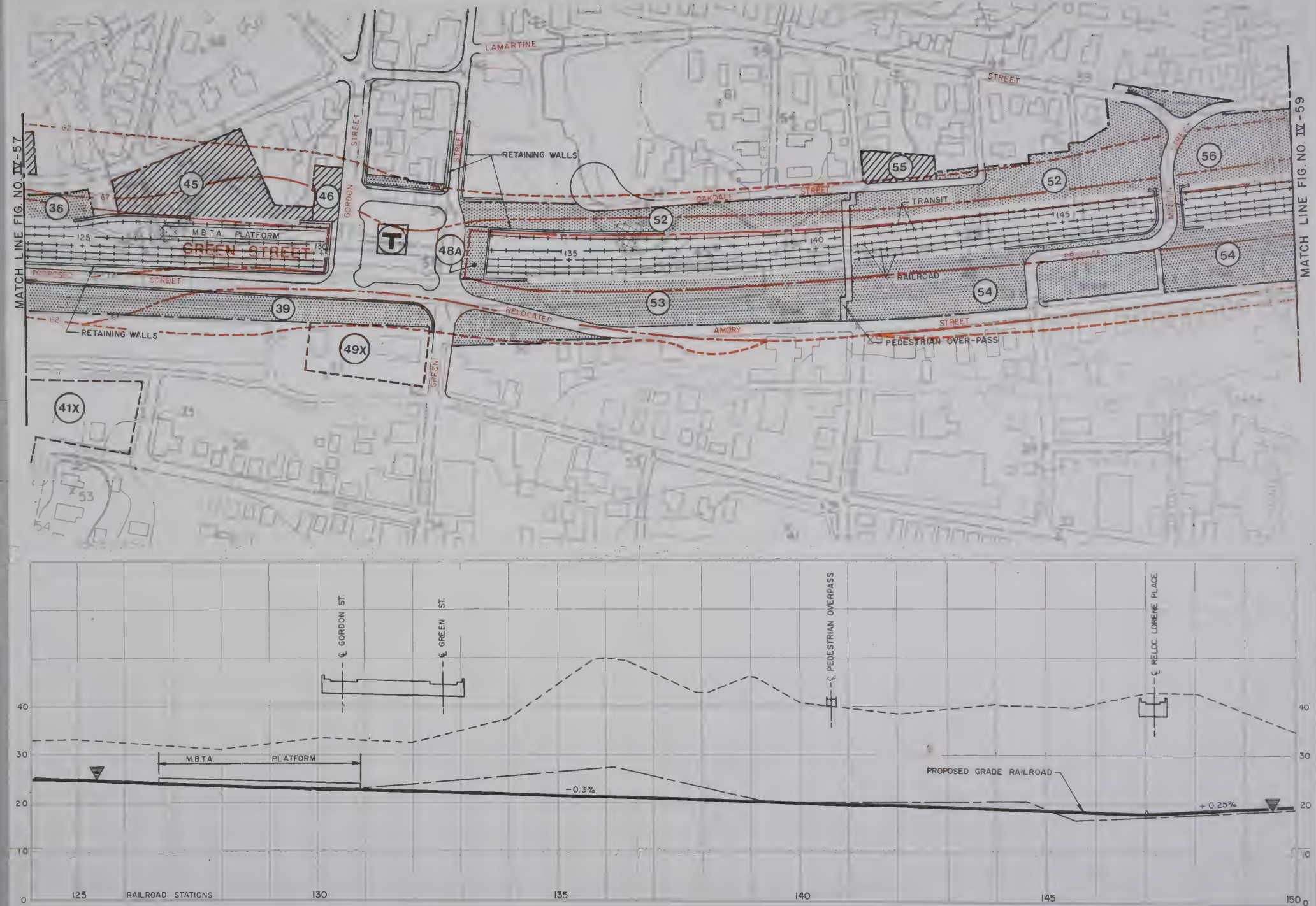


FIGURE
IV-58



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE FH-6
(CAMDEN STREET to FOREST HILLS)

MODIFIED
DEPRESSED RAIL / TRANSIT
NO ARTERIAL

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

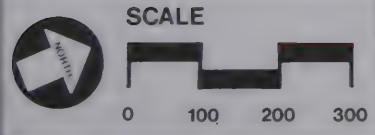
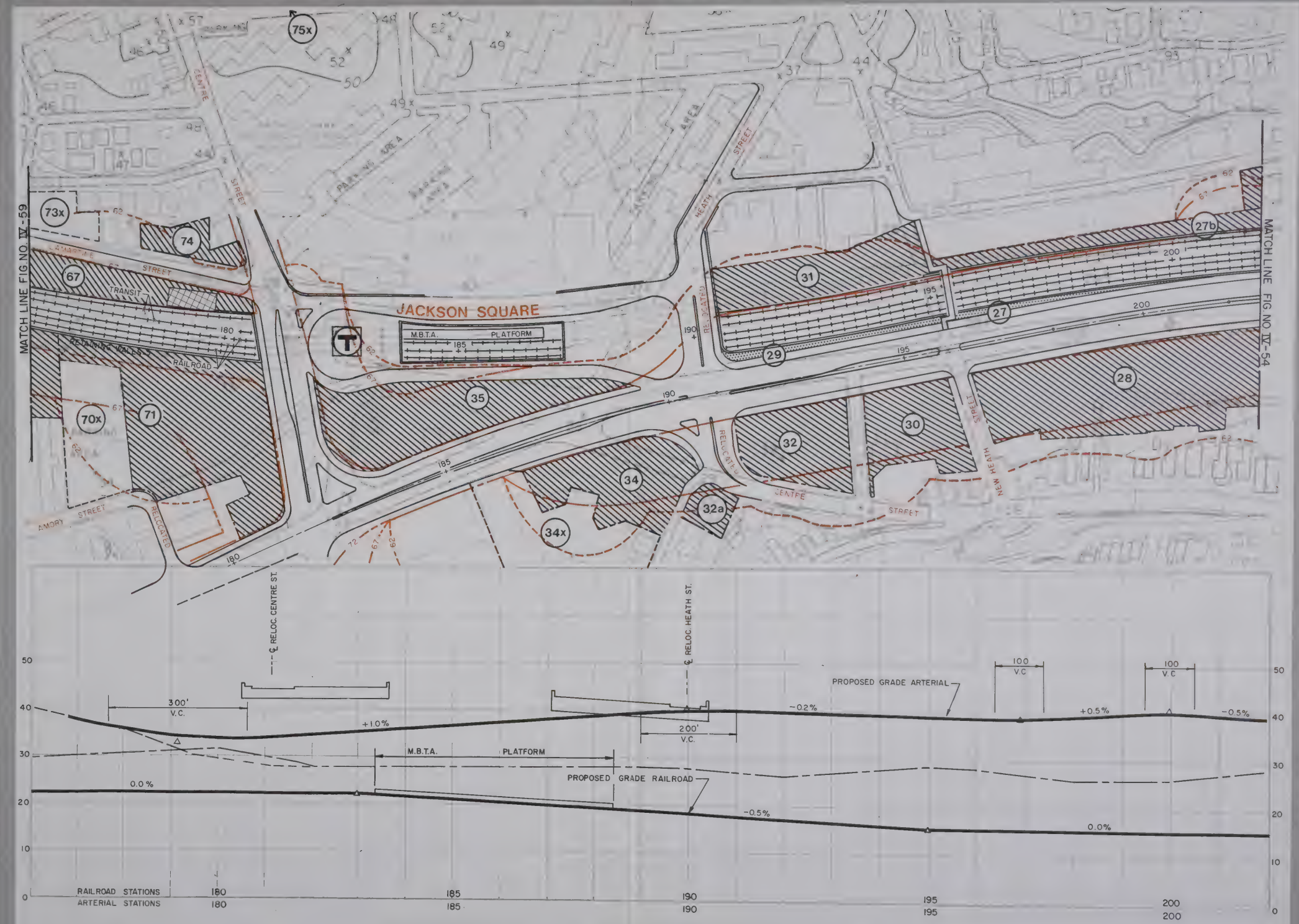


FIGURE
IV-60

FREDERIC B. HARRIS INC.



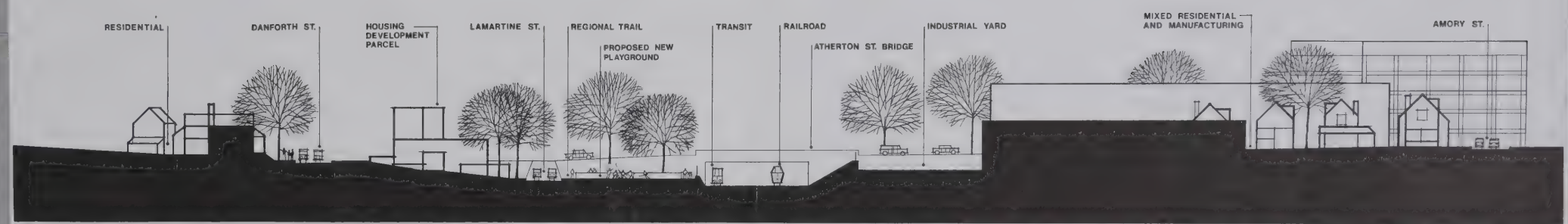
**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

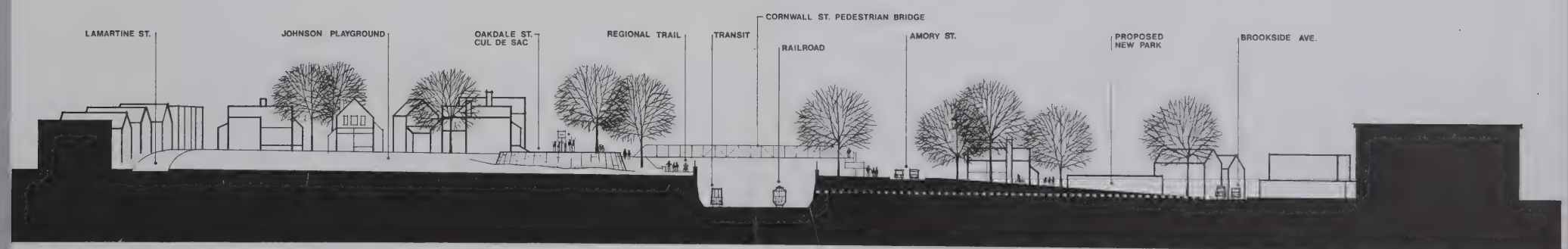
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**ILLUSTRATIVE
SECTIONS**

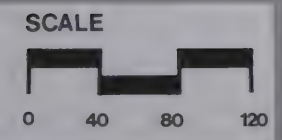
**JAMAICA PLAIN
TRACKS
MODIFIED DEPRESSED
NO ARTERIAL**



PROPOSED NEW PLAYGROUND AT BOYLSTON STATION FH6



JOHNSON PLAYGROUND AT GREEN STATION FH6



**FIGURE
IV-60A**

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

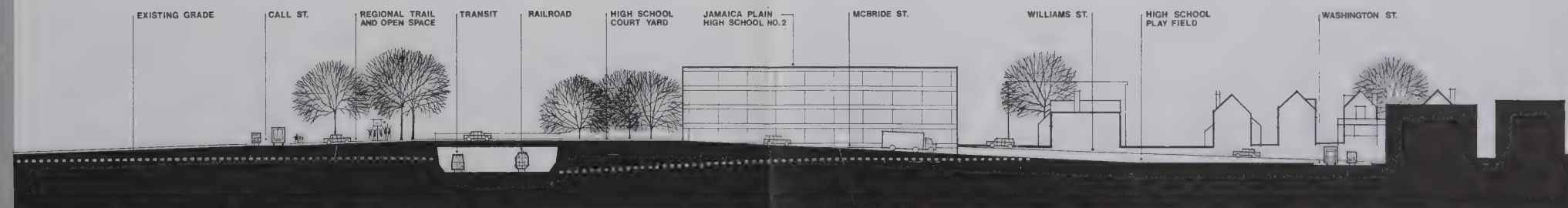
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ILLUSTRATIVE SECTIONS

TRACKS
JAMAICA PLAIN
MODIFIED DEPRESSED
NO ARTERIAL



WILLIAMS STREET FH6



MCBRIDE STREET FH6

SCALE



FIGURE

IV-60B

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**
**ENVIRONMENTAL
IMPACT ANALYSIS**

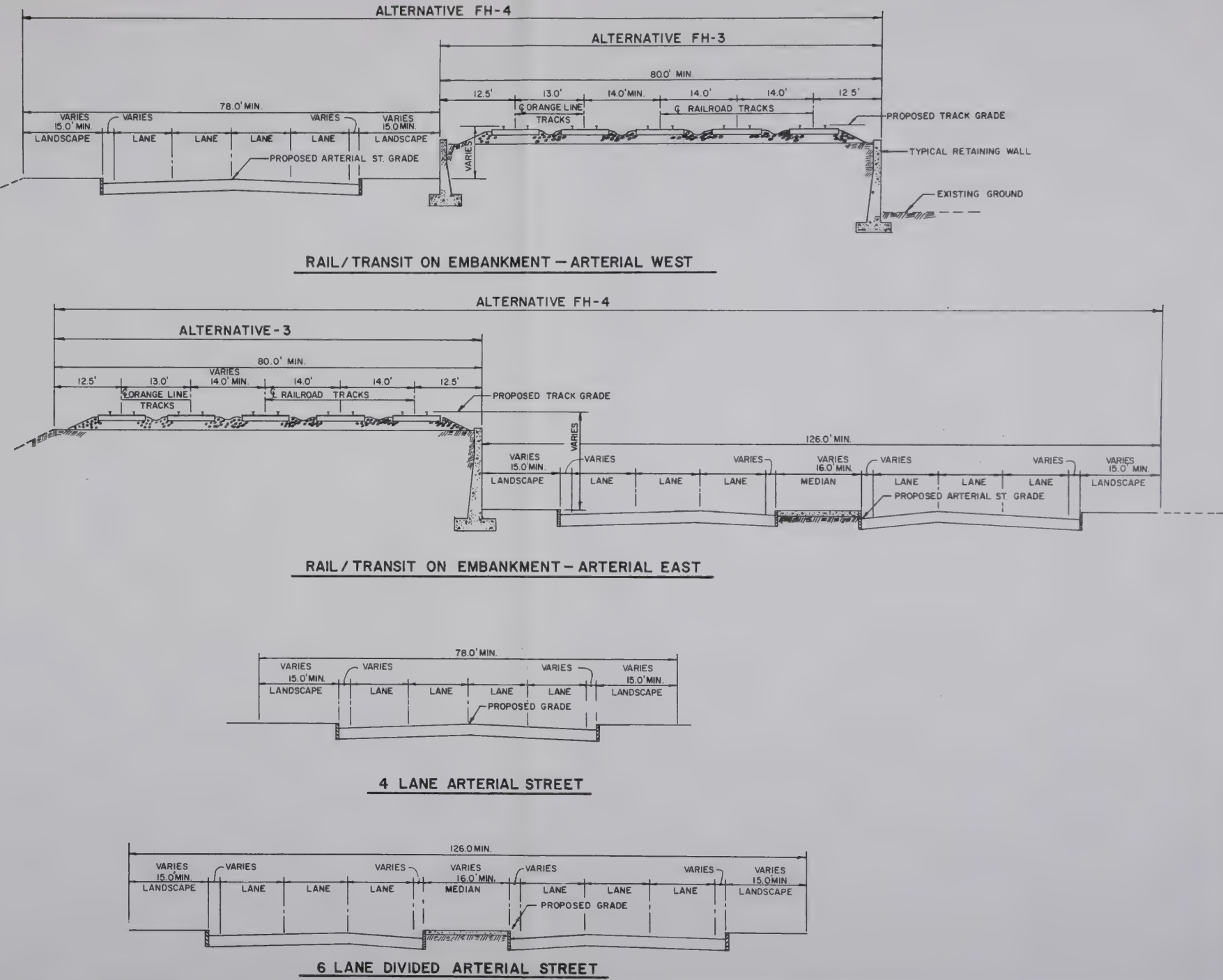
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**TYPICAL
SECTIONS**
**CAMDEN STREET
to
FOREST HILLS**

NO SCALE

FIGURE
IV-61

FREDERIC R. HARRIS INC

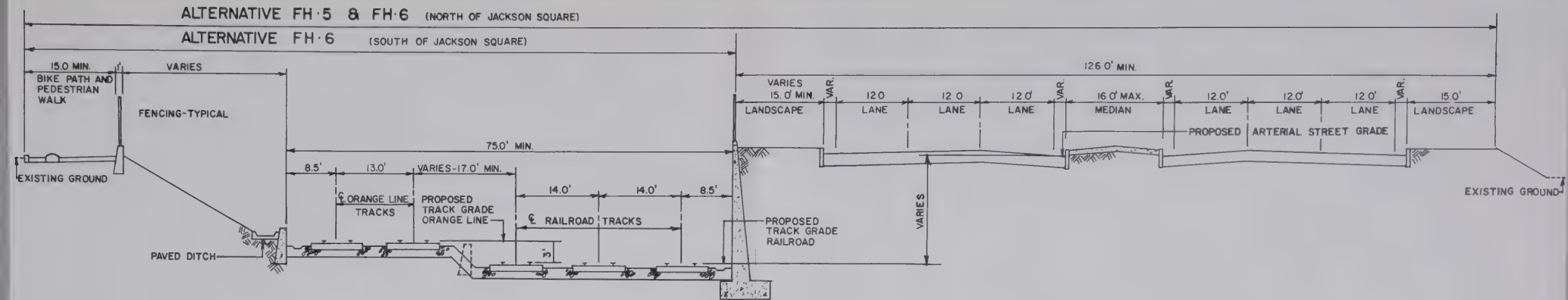


SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

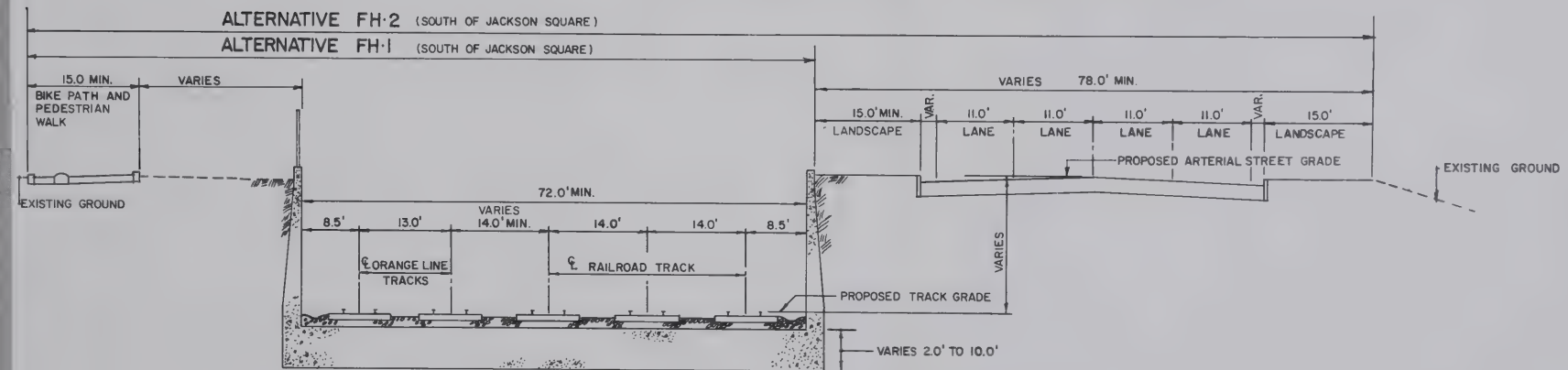
ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

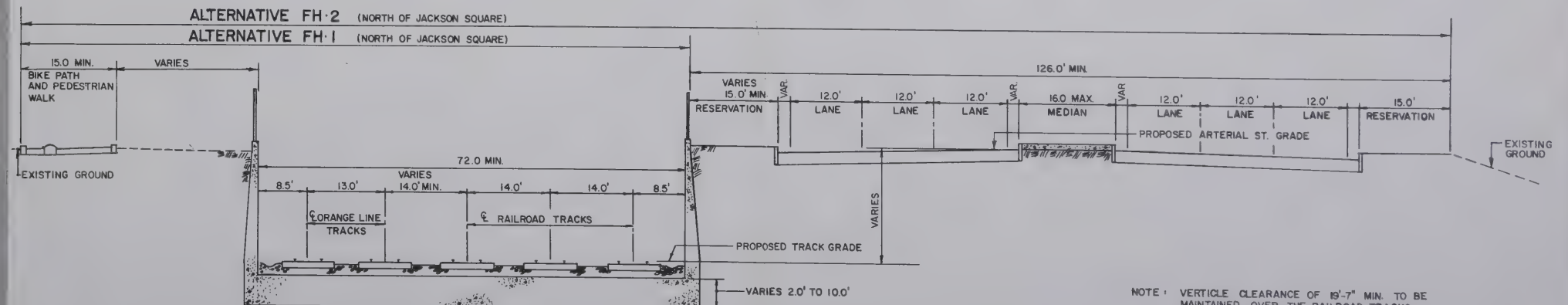
TYPICAL SECTIONS CAMDEN STREET to FOREST HILLS



RAIL / TRANSIT MODIFIED DEPRESSED - ARTERIAL EAST



RAIL / TRANSIT DEPRESSED - ARTERIAL EAST



NOTE: VERTICAL CLEARANCE OF 19'-7" MIN. TO BE MAINTAINED OVER THE RAILROAD TRACKS BETWEEN CHICKERING AND FOREST HILLS (15'-4" OVER ORANGE LINE TRACKS).

RAIL / TRANSIT DEPRESSED - ARTERIAL EAST

FREDERIC R. HARRIS INC.

FIGURE
IV-62

NO SCALE

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE SC-1
(SOUTH COVE to CAMDEN STREET)

MINIMUM GRADE ADJUSTMENTS, ALL TRACKS

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

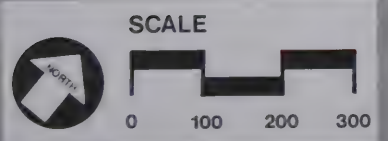
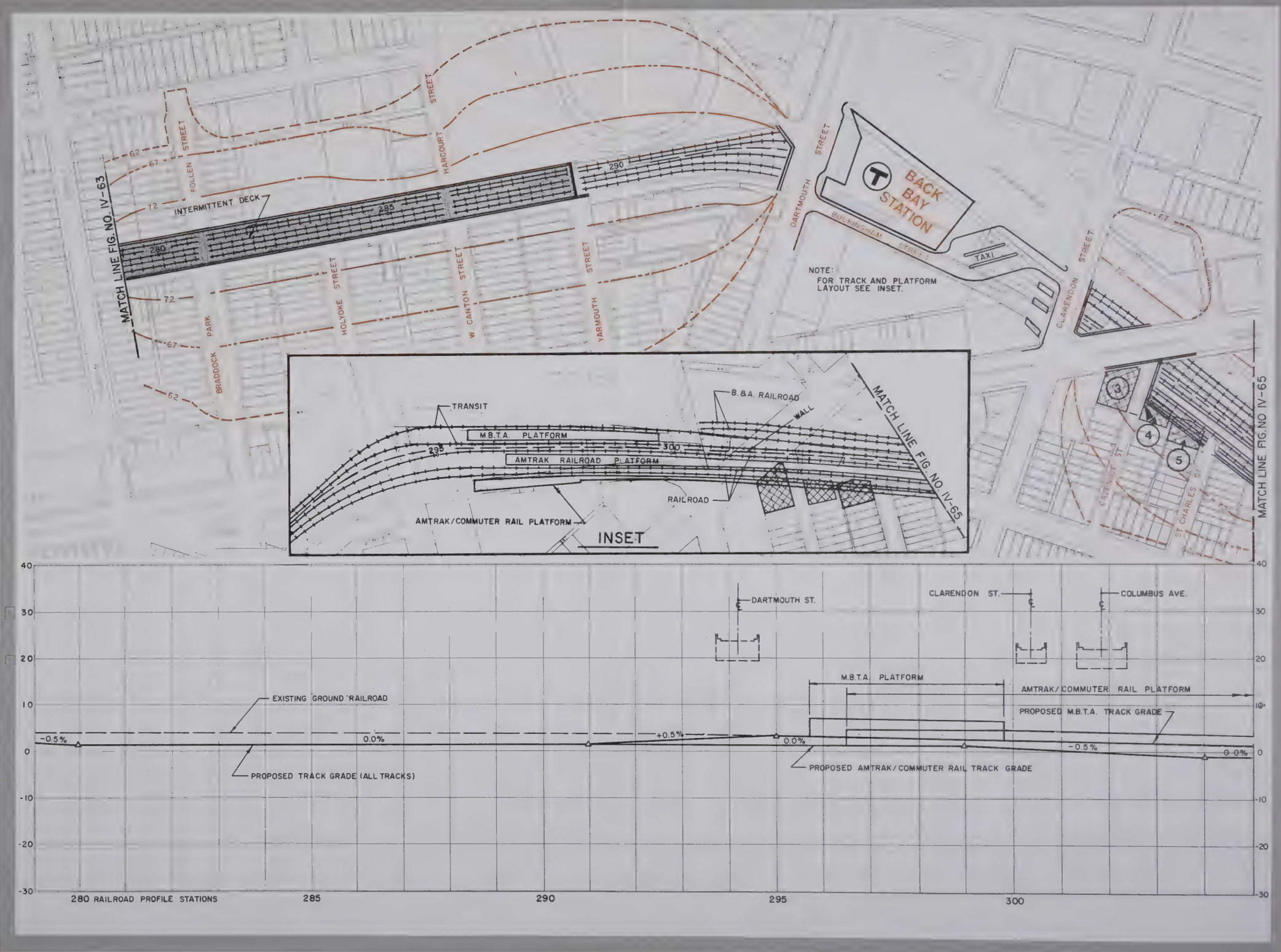


FIGURE
IV-64

FREDERIC R. HARRIS INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE SC-1
(SOUTH COVE TO CAMDEN STREET)

MINIMUM
GRADE ADJUSTMENTS,
ALL TRACKS

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- II II (67 Decibels)
- II II (72 Decibels)

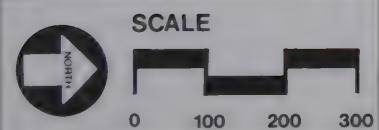
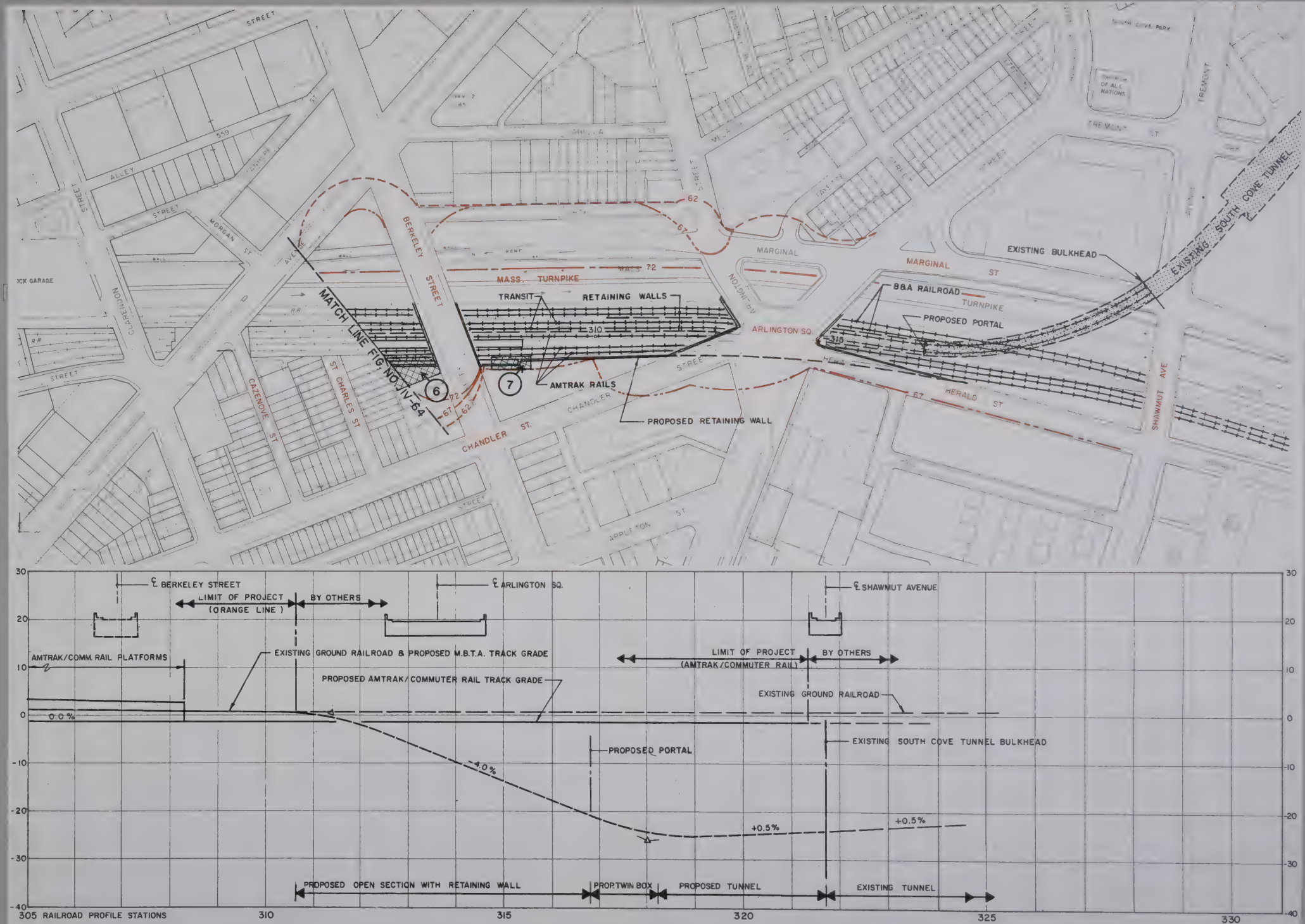


FIGURE
IV-65

FREDERIC R. HARRIS INC.



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS








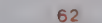
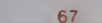
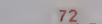
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE SC-2
(SOUTH COVE to CAMDEN STREET)

ORANGE LINE
IN TUNNEL TO
DARTMOUTH STREET

LEGEND

-  REDEVELOPMENT PARCELS
-  OPEN SPACE REDEVELOPMENT
-  POTENTIAL REDEVELOPMENT (BY OTHERS)
-  BUILDINGS TO BE REMOVED
-  PARCEL NUMBER
-  M.B.T.A. & RAILROAD TRACK
-  PROPOSED STATIONS
-  NOISE CONTOUR (62 Decibels)
-  " " (67 Decibels)
-  " " (72 Decibels)

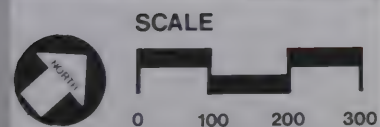
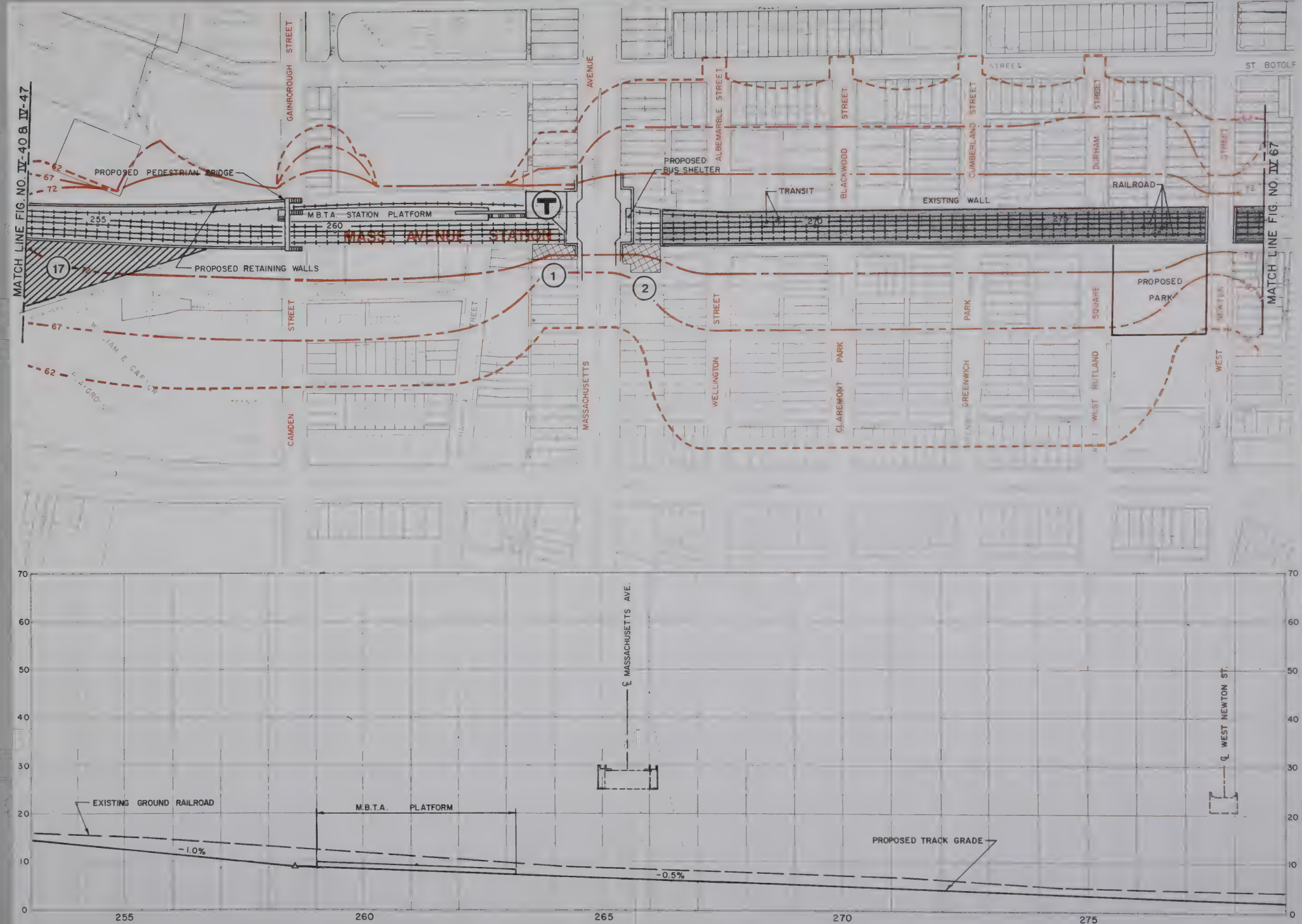


FIGURE
IV-66

FREDERIC R. HARRIS INC













ENVIRONMENTAL IMPACT ANALYSIS

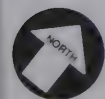
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ALTERNATIVE FH-5 (CAMDEN STREET to FOREST HILLS)

MODIFIED DEPRESSED RAIL / TRANSIT ARTERIAL STREET EAST

LEGEND

-  REDEVELOPMENT PARCELS
 OPEN SPACE REDEVELOPMENT
 POTENTIAL REDEVELOPMENT (BY OTHERS)
 BUILDINGS TO BE REMOVED
 PARCEL NUMBER
 M.B.T.A. & RAILROAD TRACK
 PROPOSED STATIONS
 NOISE CONTOUR (62 Decibels)
 67 (67 Decibels)
 72 (72 Decibels)

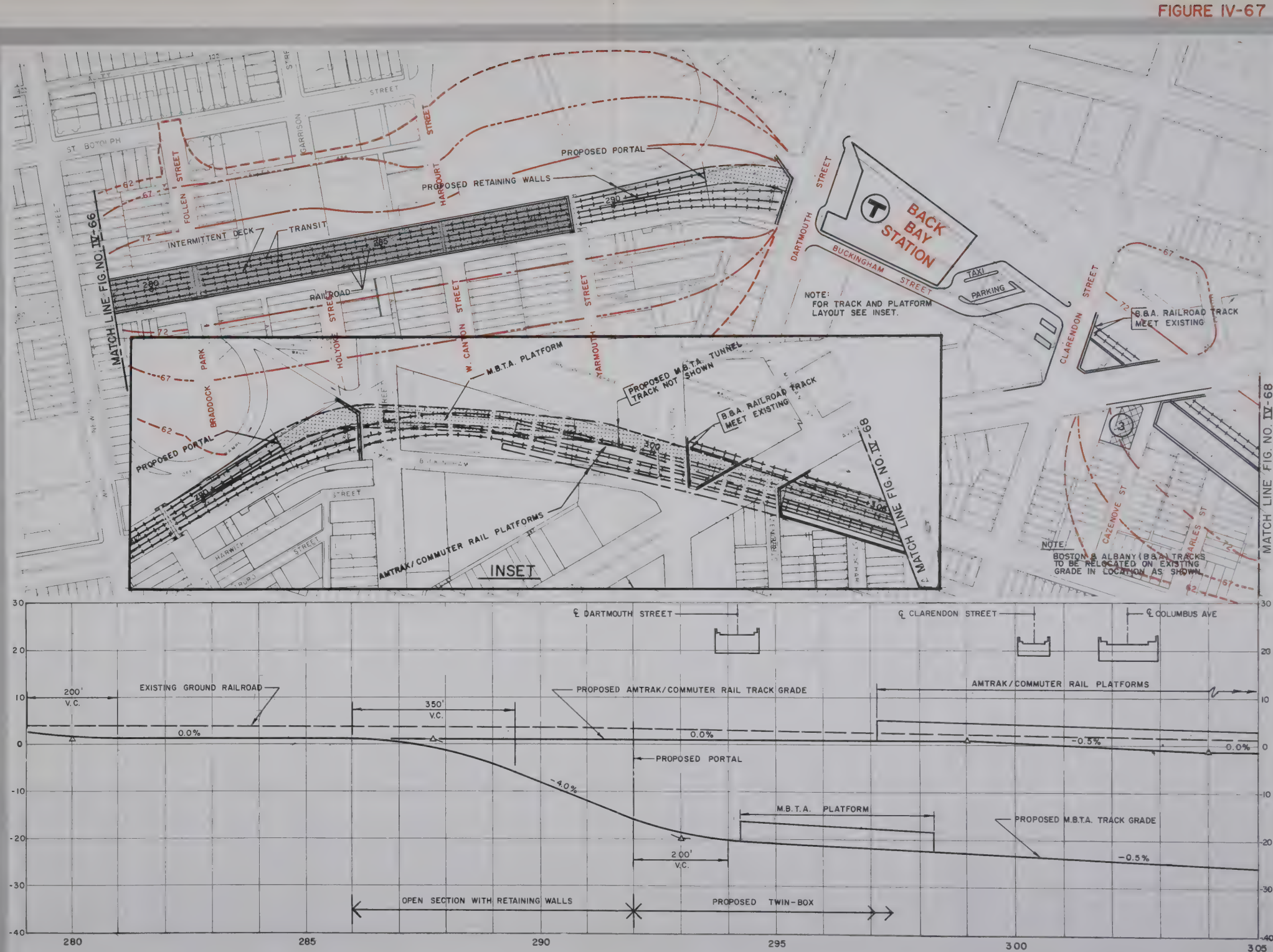


SCALE



FIGURE

IV-67



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE

ALTERNATIVE SC-2
(SOUTH COVE to CAMDEN STREET)

ORANGE LINE
IN TUNNEL TO
DARTMOUTH STREET

LEGEND

- REDEVELOPMENT PARCELS
- OPEN SPACE REDEVELOPMENT
- POTENTIAL REDEVELOPMENT (BY OTHERS)
- BUILDINGS TO BE REMOVED
- PARCEL NUMBER
- M.B.T.A. & RAILROAD TRACK
- PROPOSED STATIONS
- NOISE CONTOUR (62 Decibels)
- NOISE CONTOUR (67 Decibels)
- NOISE CONTOUR (72 Decibels)

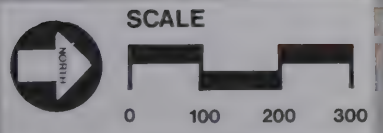
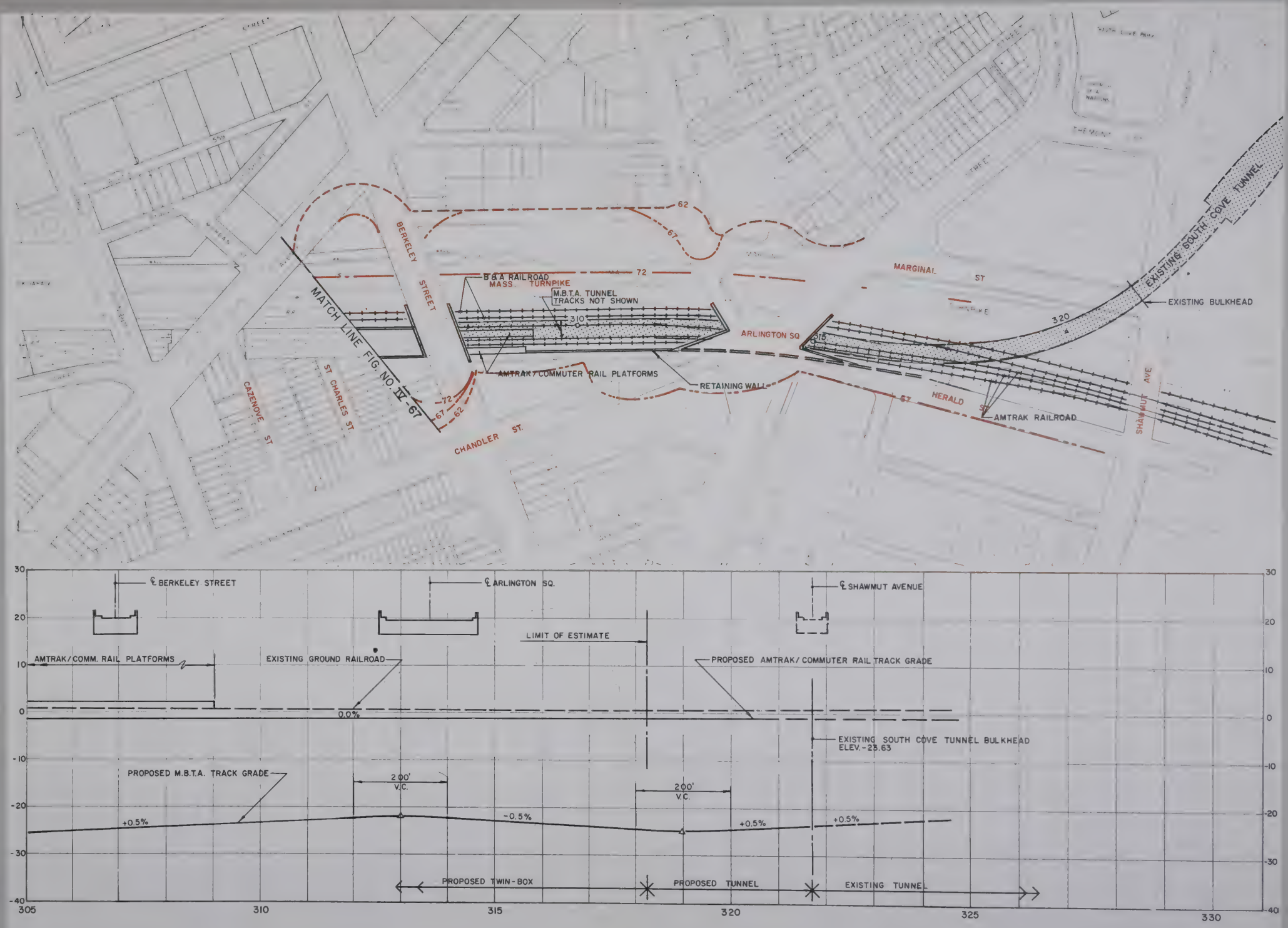


FIGURE
IV-68



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ILLUSTRATIVE SECTIONS

BACK BAY

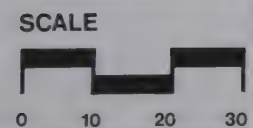
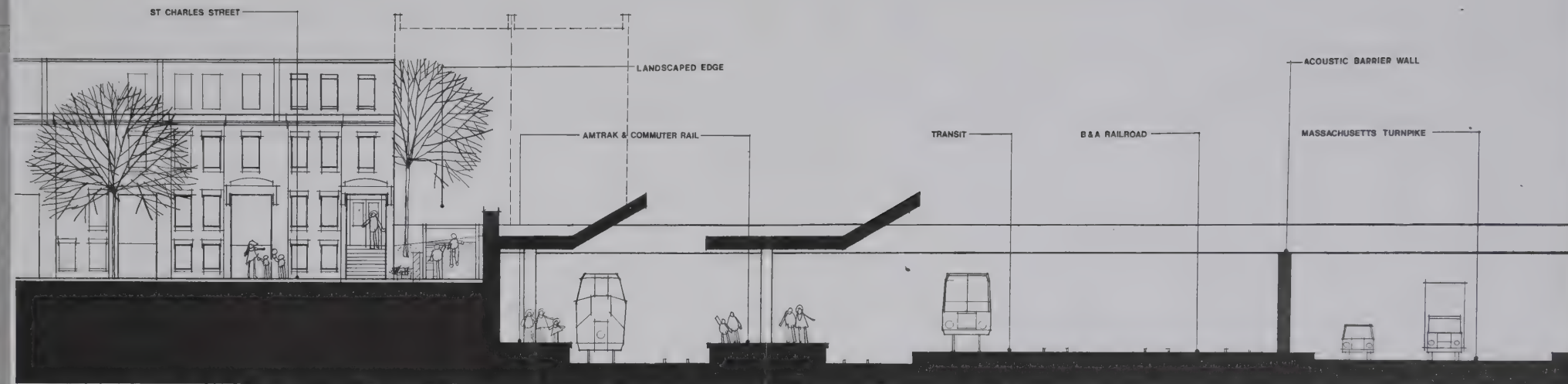
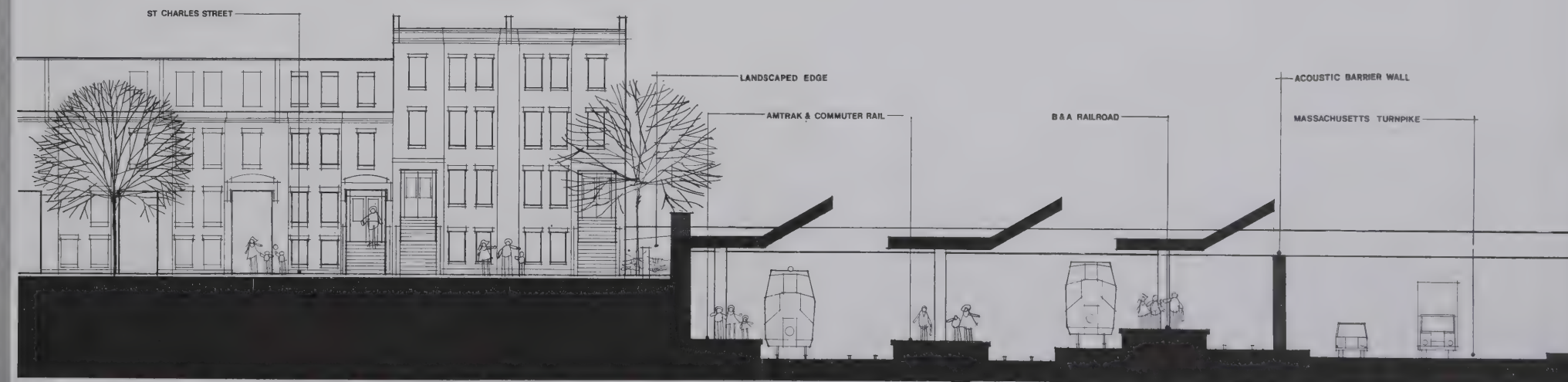


FIGURE
IV-68A



ALTERNATIVE SC-1



ALTERNATIVE SC-2

TRANSIT TUNNEL

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ILLUSTRATIVE SECTIONS

SOUTH END

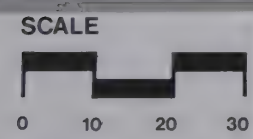
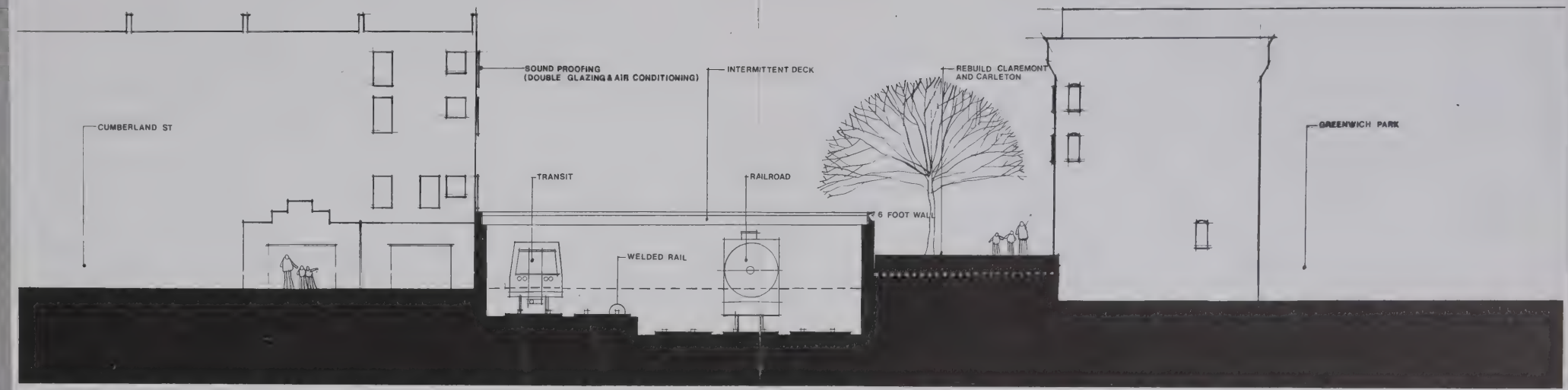
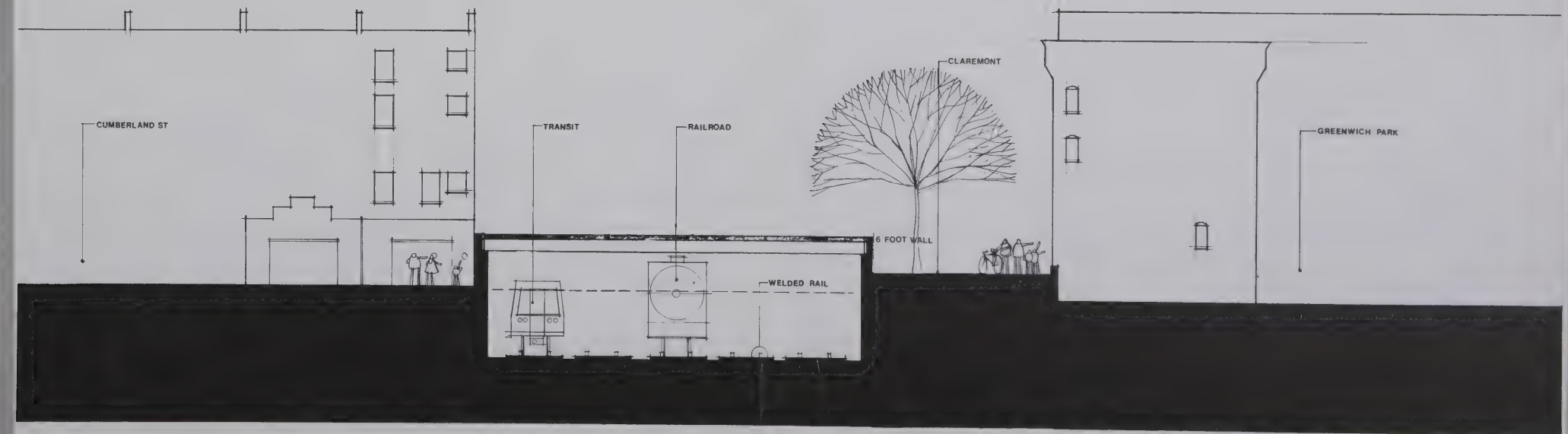


FIGURE
IV-68B



TRACKS DEPRESSED 2 TO 5 FEET SC1



TRACKS DEPRESSED SC1

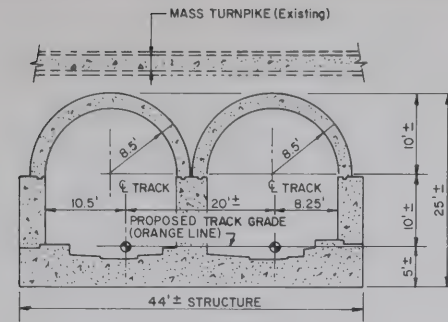
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

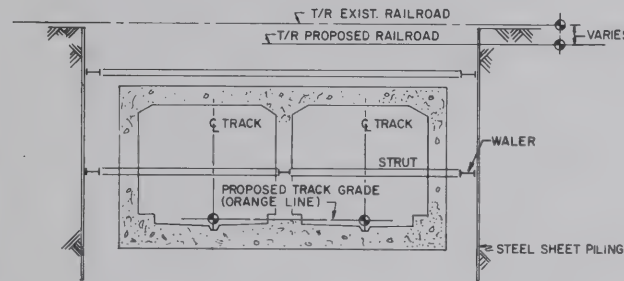
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION DETAILS

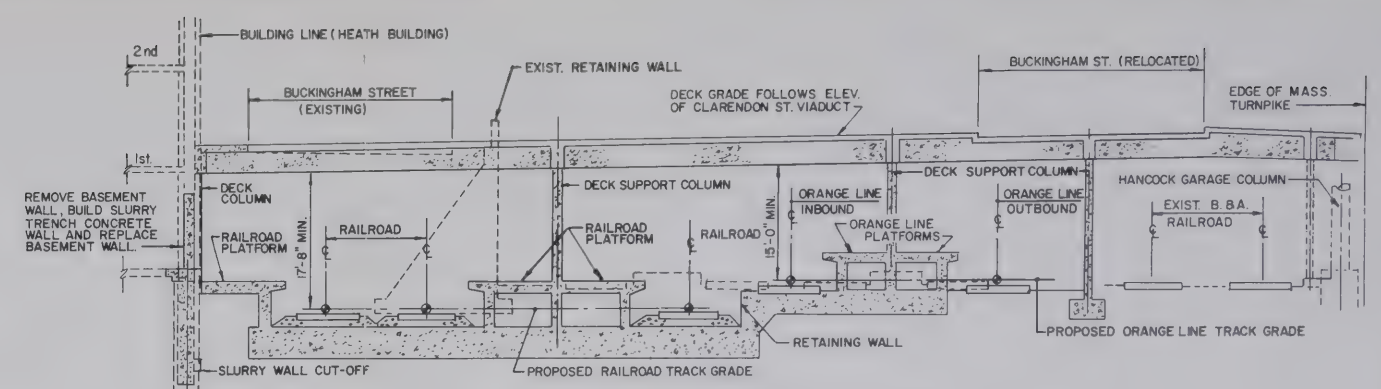
SOUTH COVE
TO
CAMDEN
SC-1



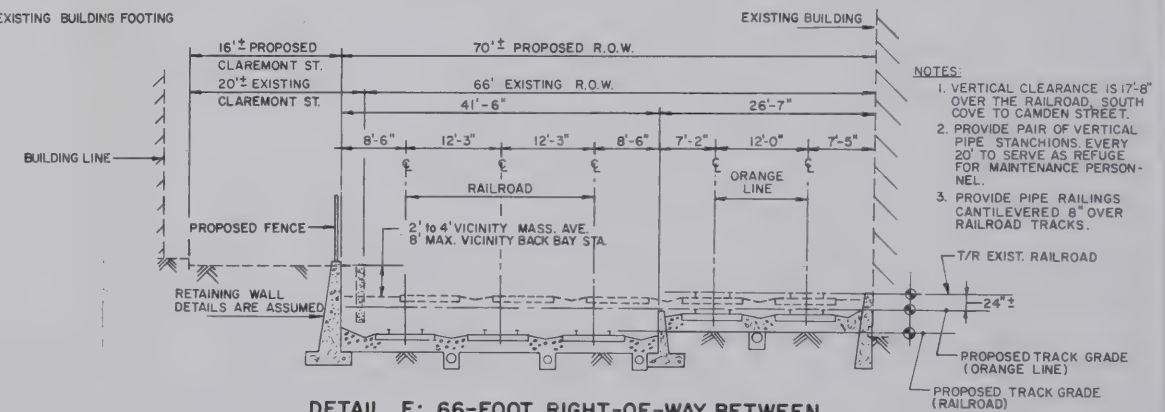
DETAIL A: TWIN-ARCHED TUNNEL
SECTION AT STATION 320+50
(BY OTHERS)



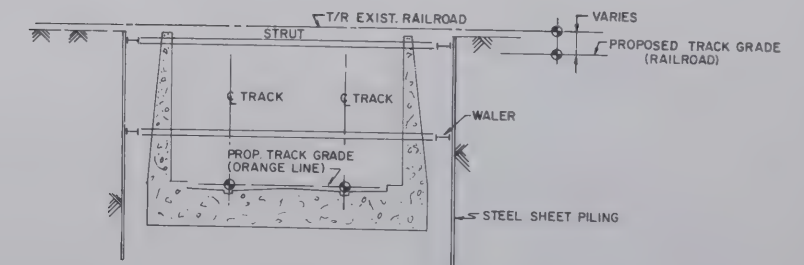
DETAIL B: TRANSITION SECTION TWIN-BOX
SECTION AT STATION 318+00
(BY OTHERS)



DETAIL D: HEATH BUILDING
SECTION LOOKING OUT-BOUND TAKEN SOUTH OF EXISTING CLARENDON ST. VIADUCT
ALT. SC-1



DETAIL E: 66-FOOT RIGHT-OF-WAY BETWEEN
BACK BAY STATION & CAMDEN STREET (LOOKING SOUTH)
ALT. SC-1



DETAIL C: U-SHAPED BOAT SECTION
SECTION A STATION 290+00 ALT. SC-1
(BY OTHERS)

GENERAL NOTE:
"RAILROAD" REFERS TO
FRA/AMTRAK AND COMMUTER
RAILS.

FREDERIC R. HARRIS INC.

FIGURE
IV-69

NO SCALE

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

SOUTH COVE TO CAMDEN

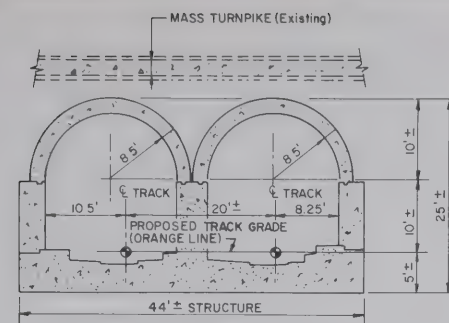
SC-2

NO SCALE

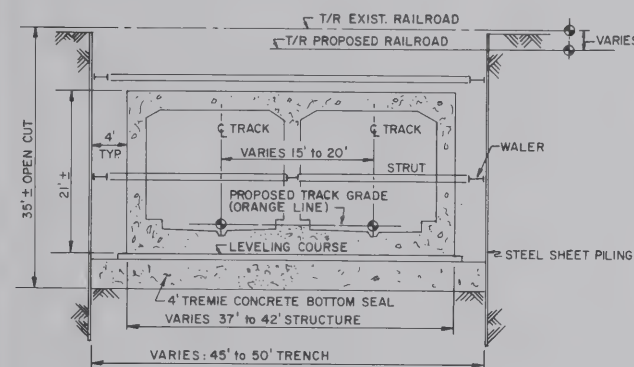
FIGURE
IV-69A

FREDERIC B. HARRIS, INC.

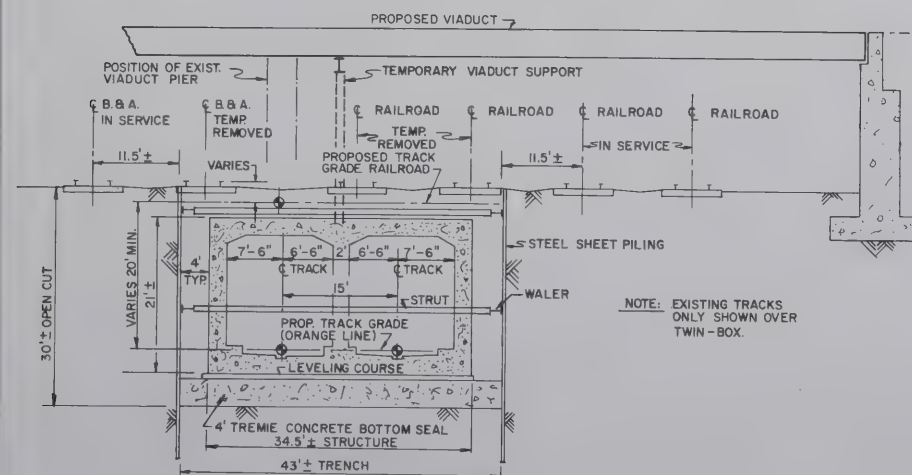
FIGURE IV-69A



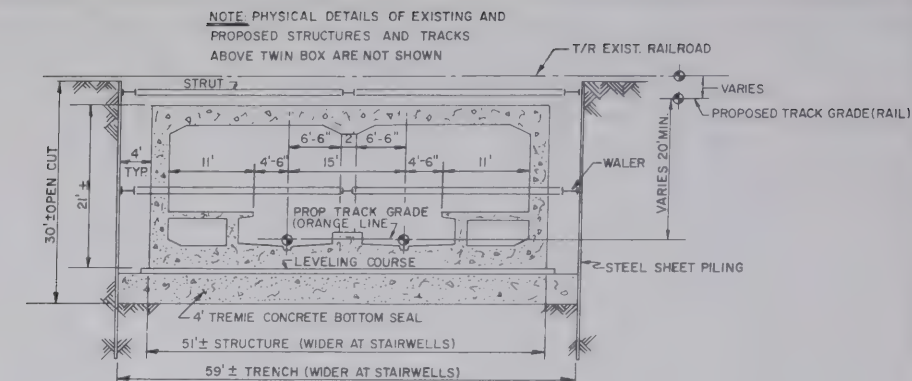
DETAIL A: TWIN-ARCHED TUNNEL
SECTION AT STATION 320+50
(BY OTHERS)



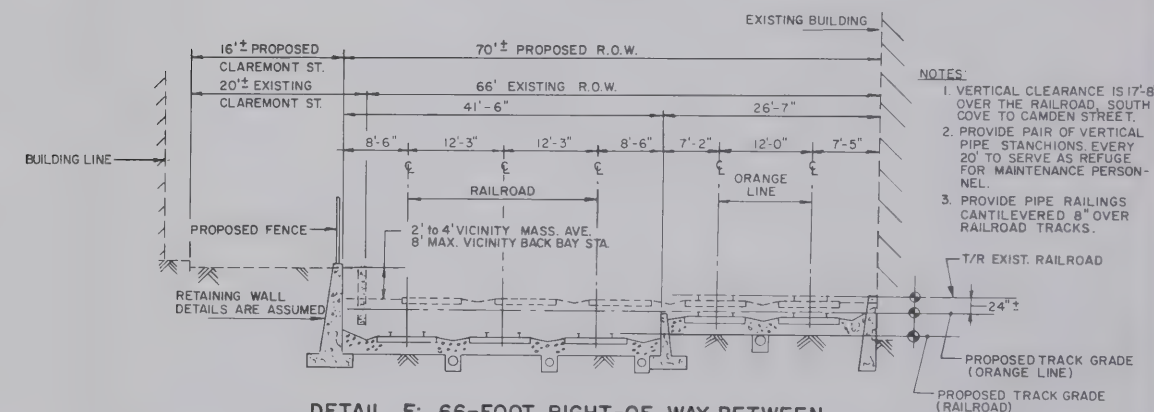
DETAIL B: TRANSITION SECTION TWIN-BOX
SECTION AT STATION 318+00
ALT. SC-2



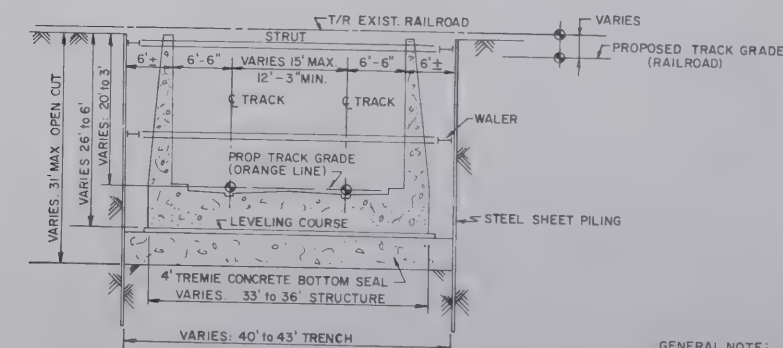
DETAIL C: CLOSE-COUPLED TWIN-BOX
SECTION AT STATION 307+00 ALT. SC-2



DETAIL D: TWIN-BOX WITH SIDE PLATFORMS
SECTION AT STATION 295+00
ALT. SC-2



DETAIL F: 66-FOOT RIGHT-OF-WAY BETWEEN
BACK BAY STATION & CAMDEN STREET (LOOKING SOUTH)
ALT. SC-2



DETAIL E: U-SHAPED BOAT SECTION
SECTION A STATION 290+00 ALT. SC-2

GENERAL NOTE:
"RAILROAD" REFERS TO
FRA/AMTRAK AND COMMUTER
RAILS

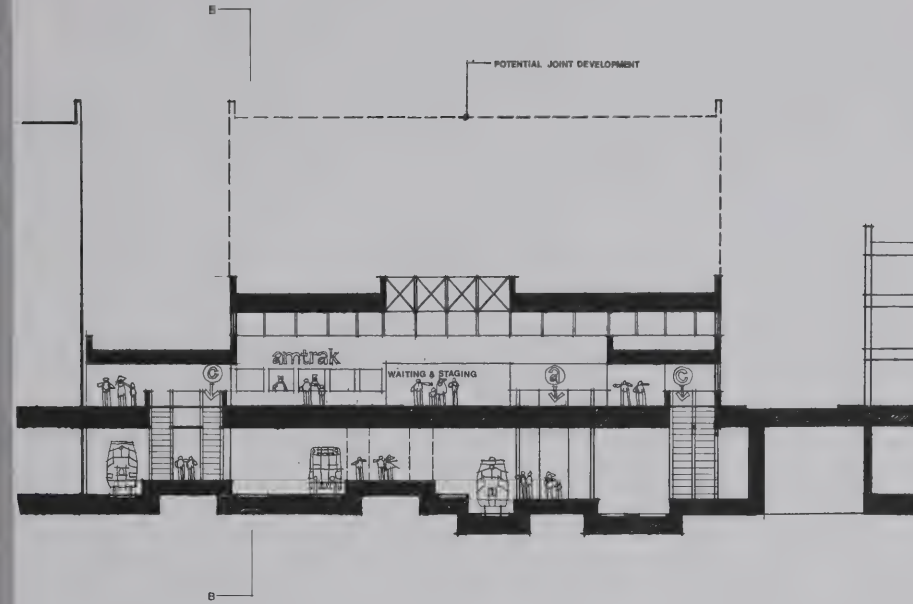
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BACK BAY STATION

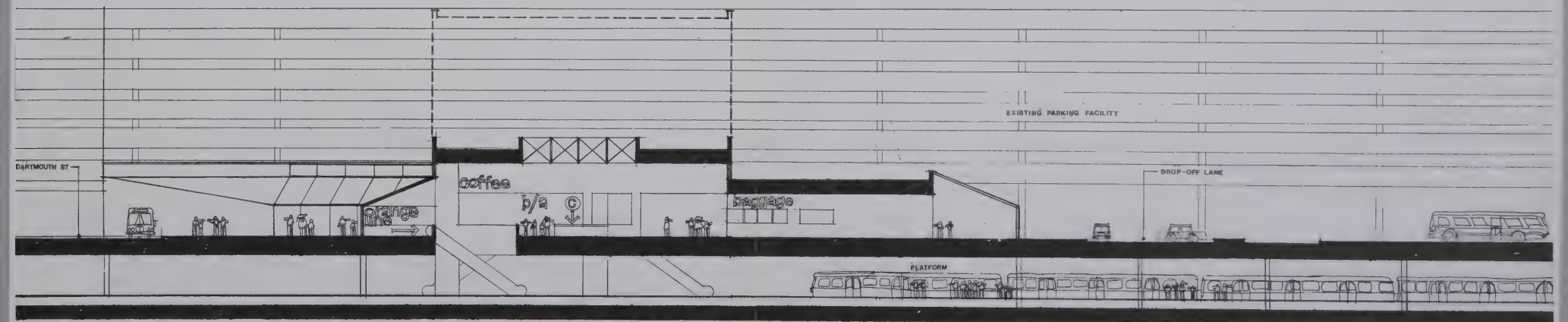
RAIL AND TRANSIT
AT GRADE



SECTION A



LOCATION PLAN



SECTION B

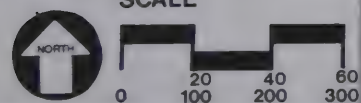


FIGURE
IV-70

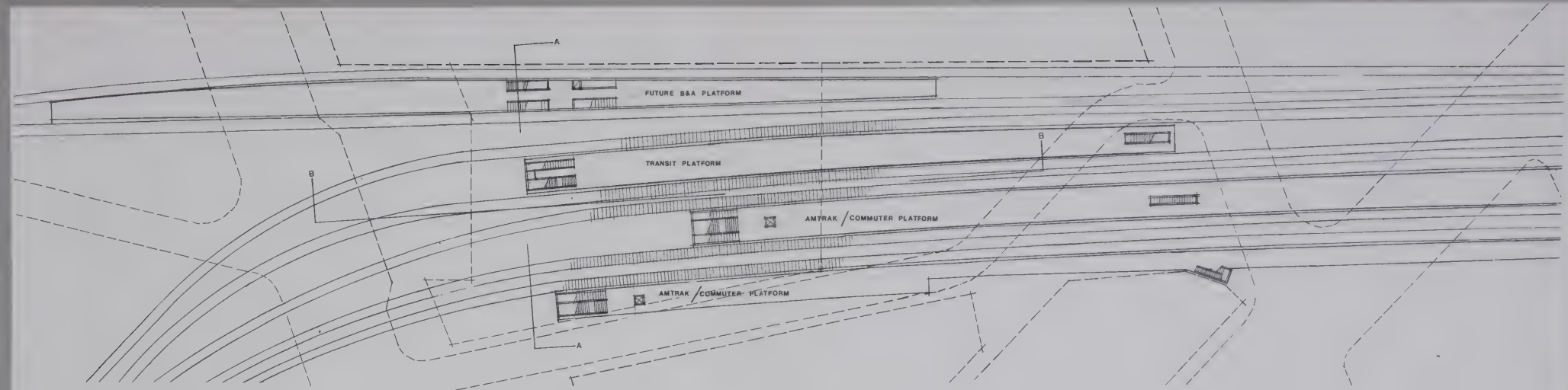
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

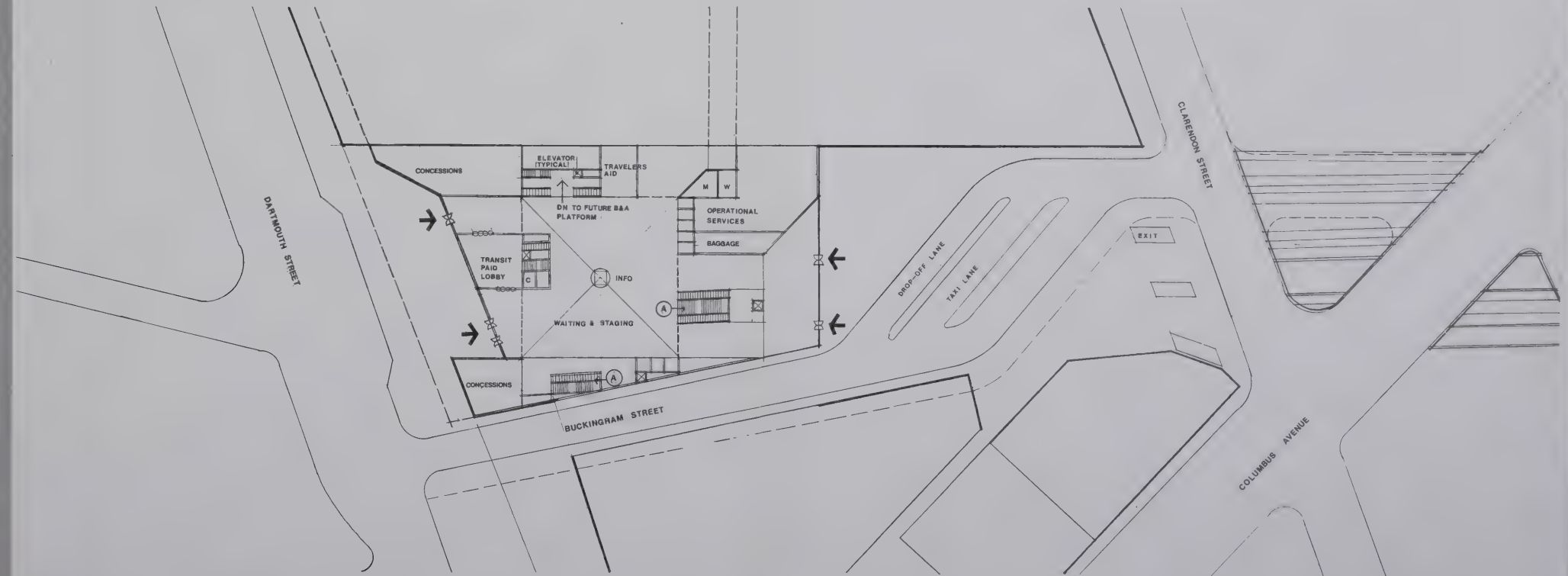
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BACK BAY STATION

RAIL AND TRANSIT
AT GRADE



PLATFORM PLAN



STATION PLAN

FREDERIC R. HARRIS INC.

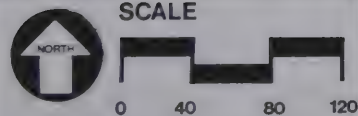


FIGURE
IV-71

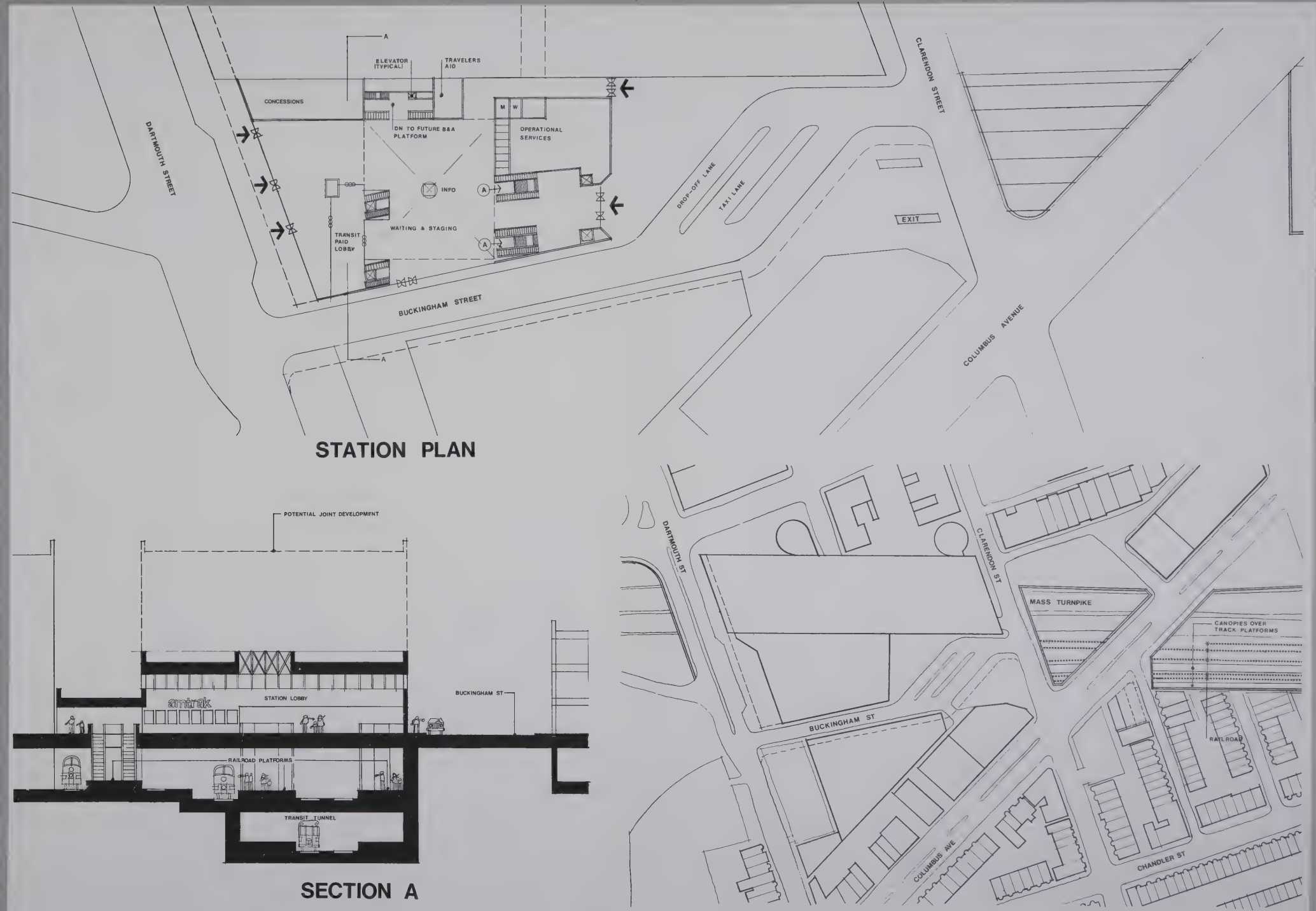
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BACK BAY STATION

TRANSIT IN TUNNEL



STATION PLAN

SECTION A

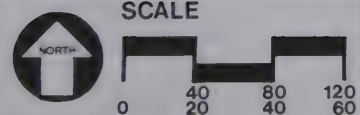


FIGURE
IV-72

FREDERIC R. HARRIS INC.

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**
**ENVIRONMENTAL
IMPACT ANALYSIS**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**BACK BAY
STATION**

TRANSIT IN TUNNEL

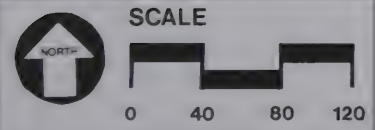
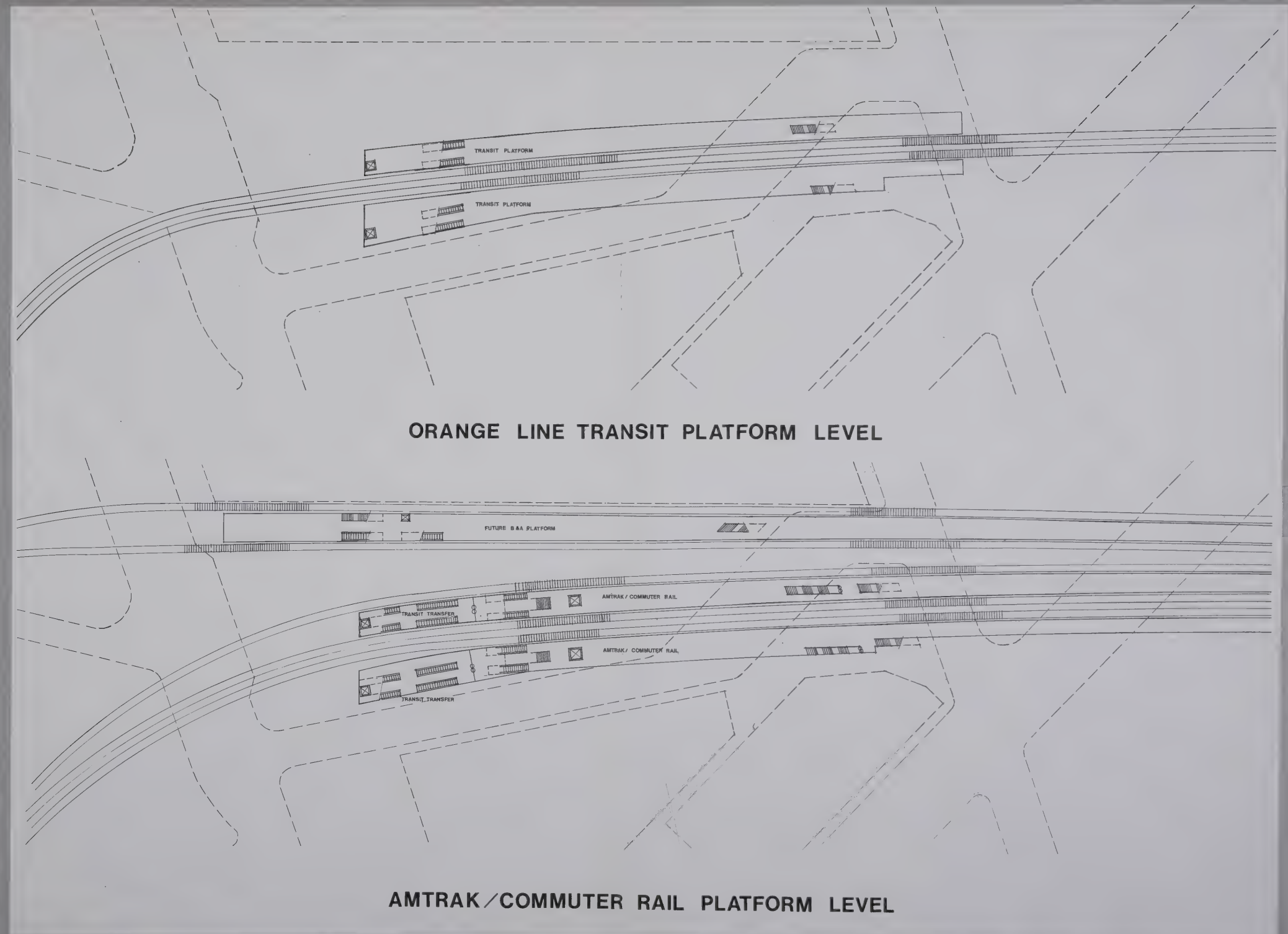


FIGURE
IV-73

FREDERIC R. HARRIS INC.



**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**
**ENVIRONMENTAL
IMPACT ANALYSIS**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**MASS AVENUE
STATION**

TRACKS AT EXISTING GRADE

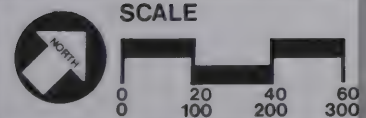
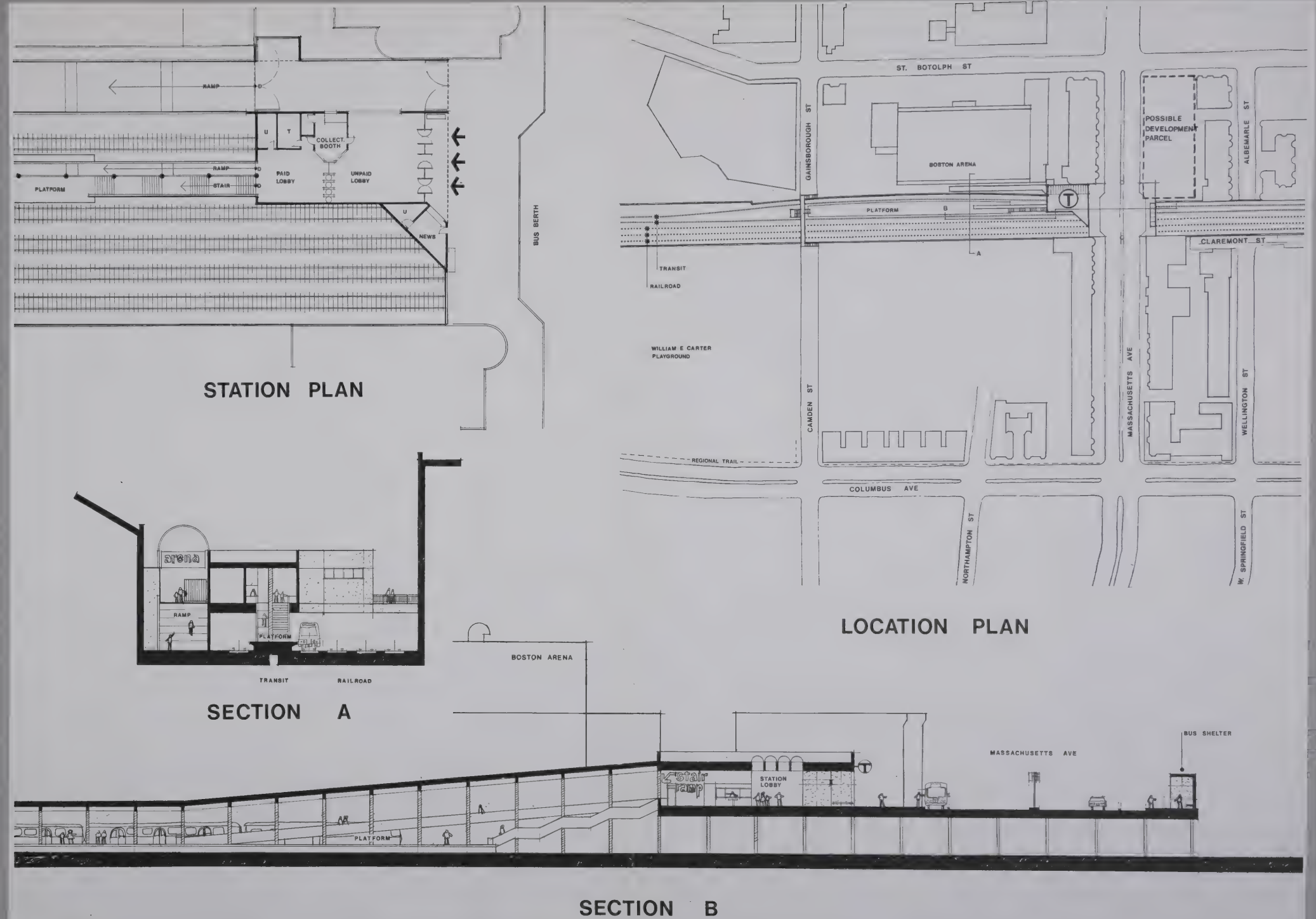


FIGURE
IV-74

FREDERIC R. HARRIS INC.



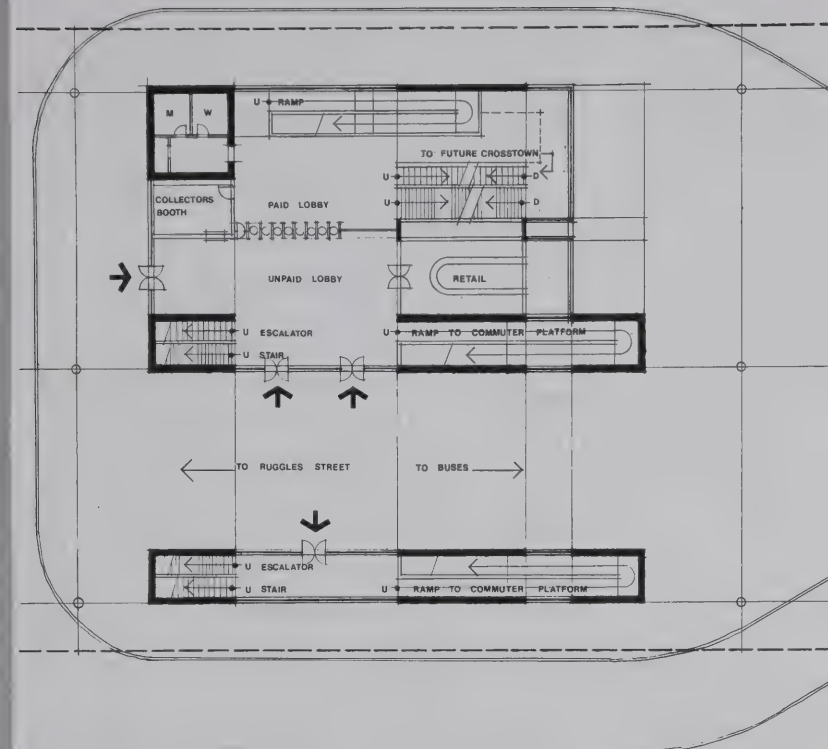
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

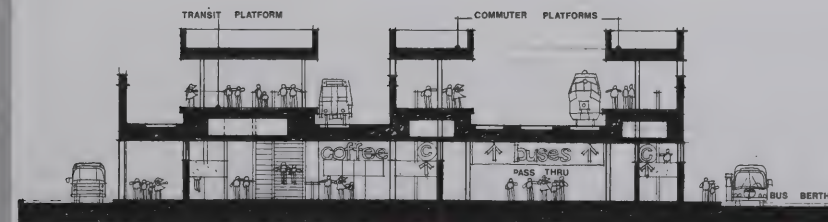
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

RUGGLES STREET STATION

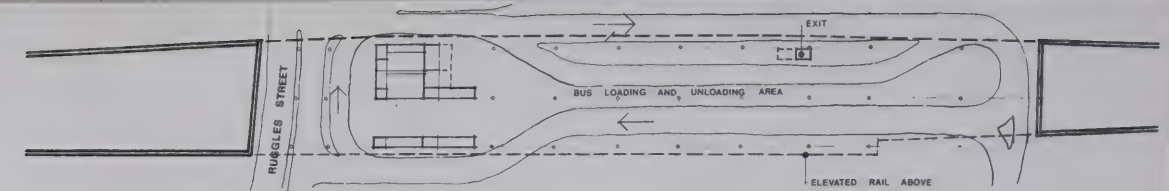
TRACKS ELEVATED



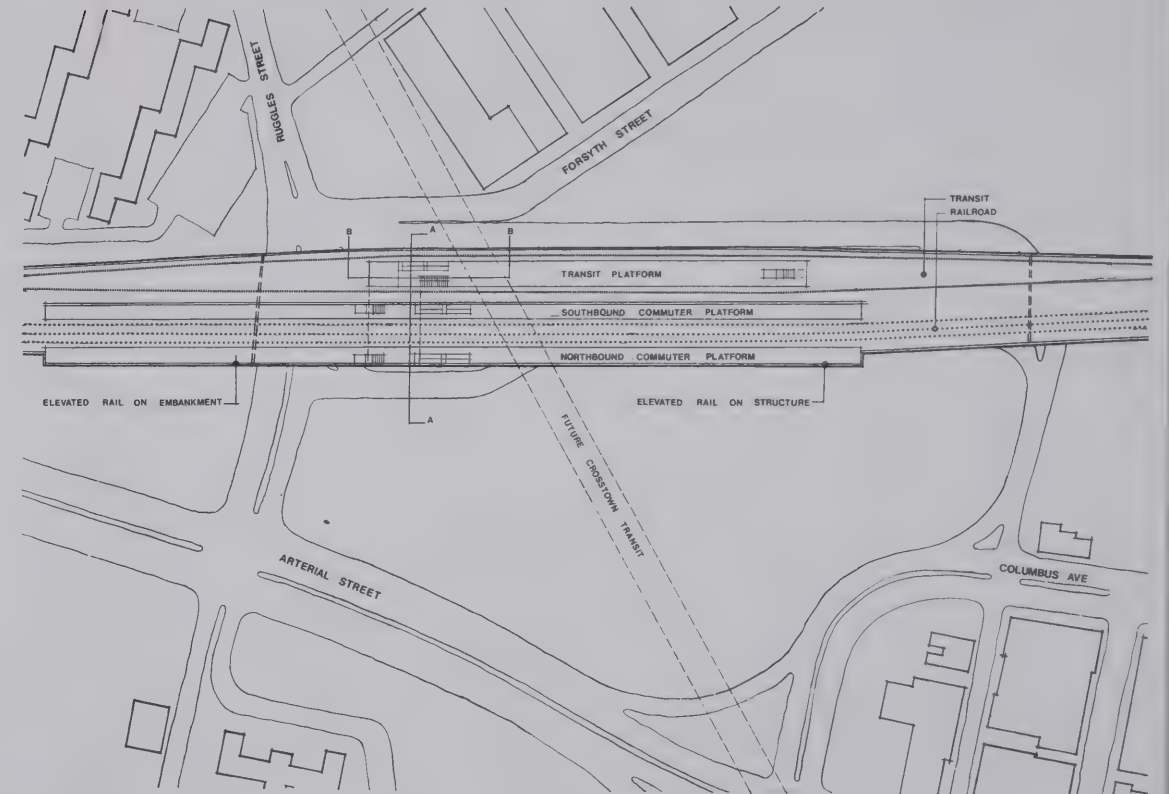
STATION PLAN



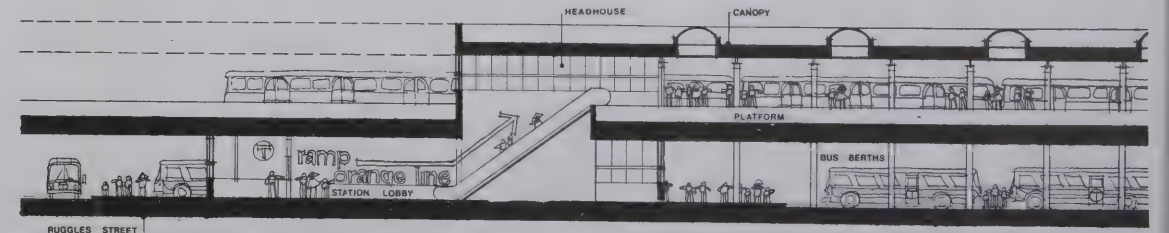
SECTION A



BUS LOOP PLAN



LOCATION PLAN



SECTION B

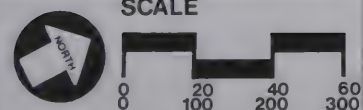


FIGURE
IV-75

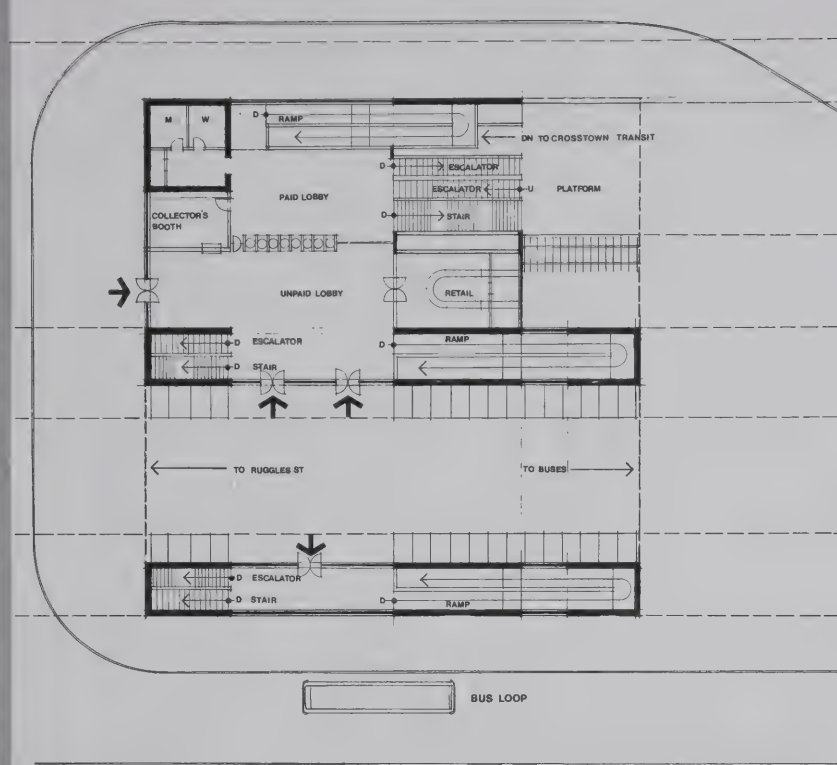
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

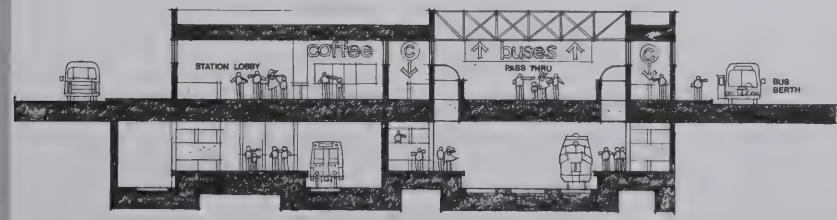
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

RUGGLES STREET STATION

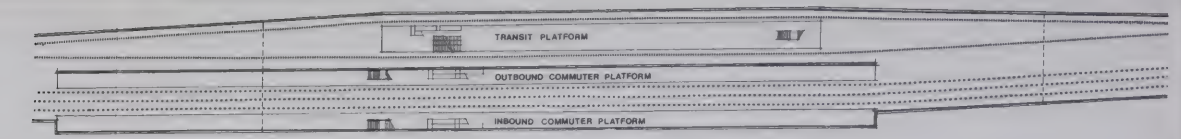
TRACKS DEPRESSED



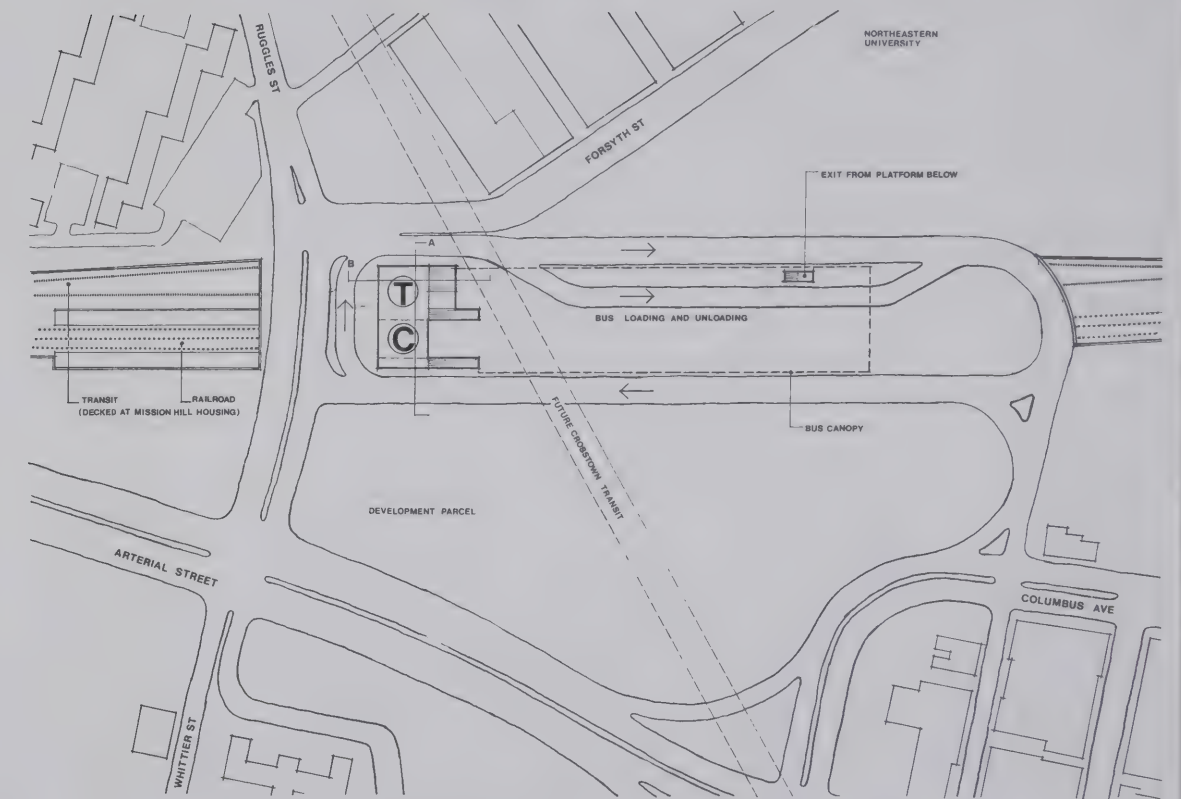
STATION PLAN



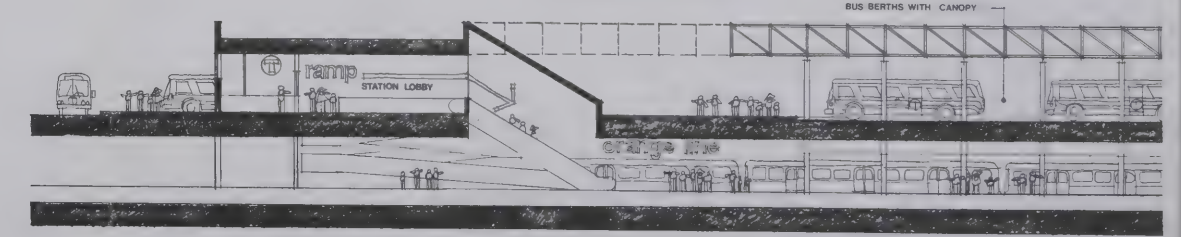
SECTION A



PLATFORM PLAN



LOCATION PLAN



SECTION B

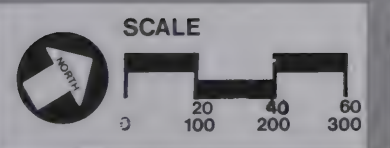


FIGURE
IV-76

FREDERIC R. HARRIS INC.

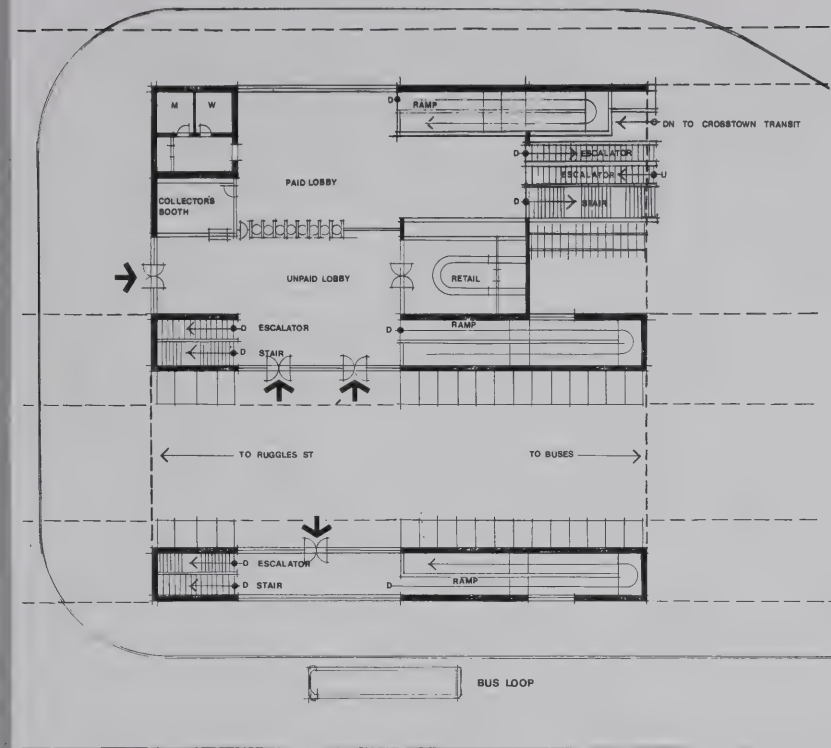
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

RUGGLES STREET

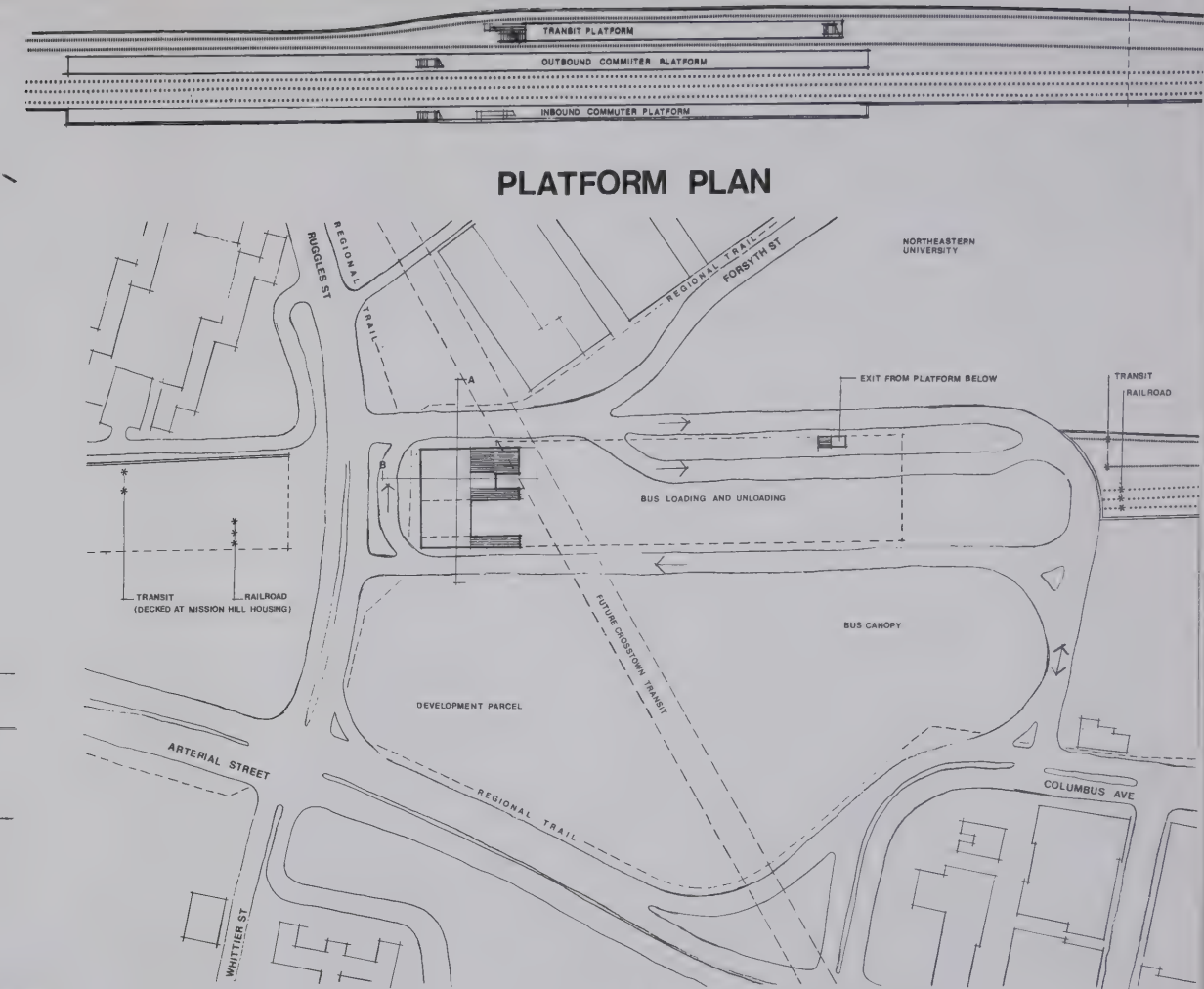
TRACKS MODIFIED DEPRESSED



STATION PLAN

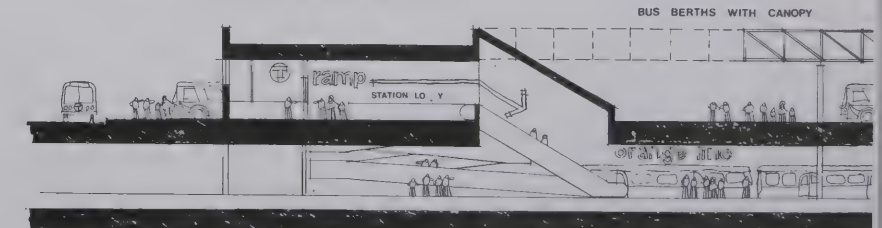


SECTION A



PLATFORM PLAN

LOCATION PLAN



SECTION B

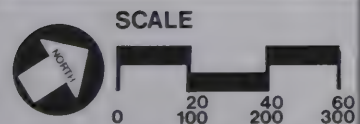


FIGURE
IV-77

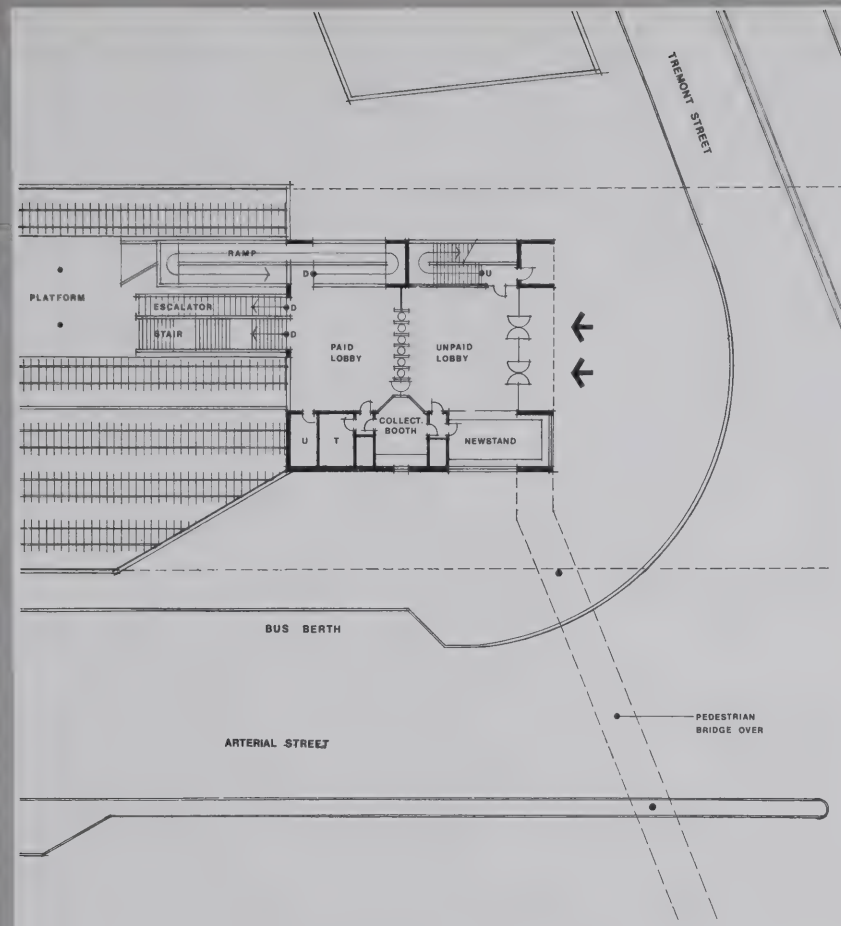
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

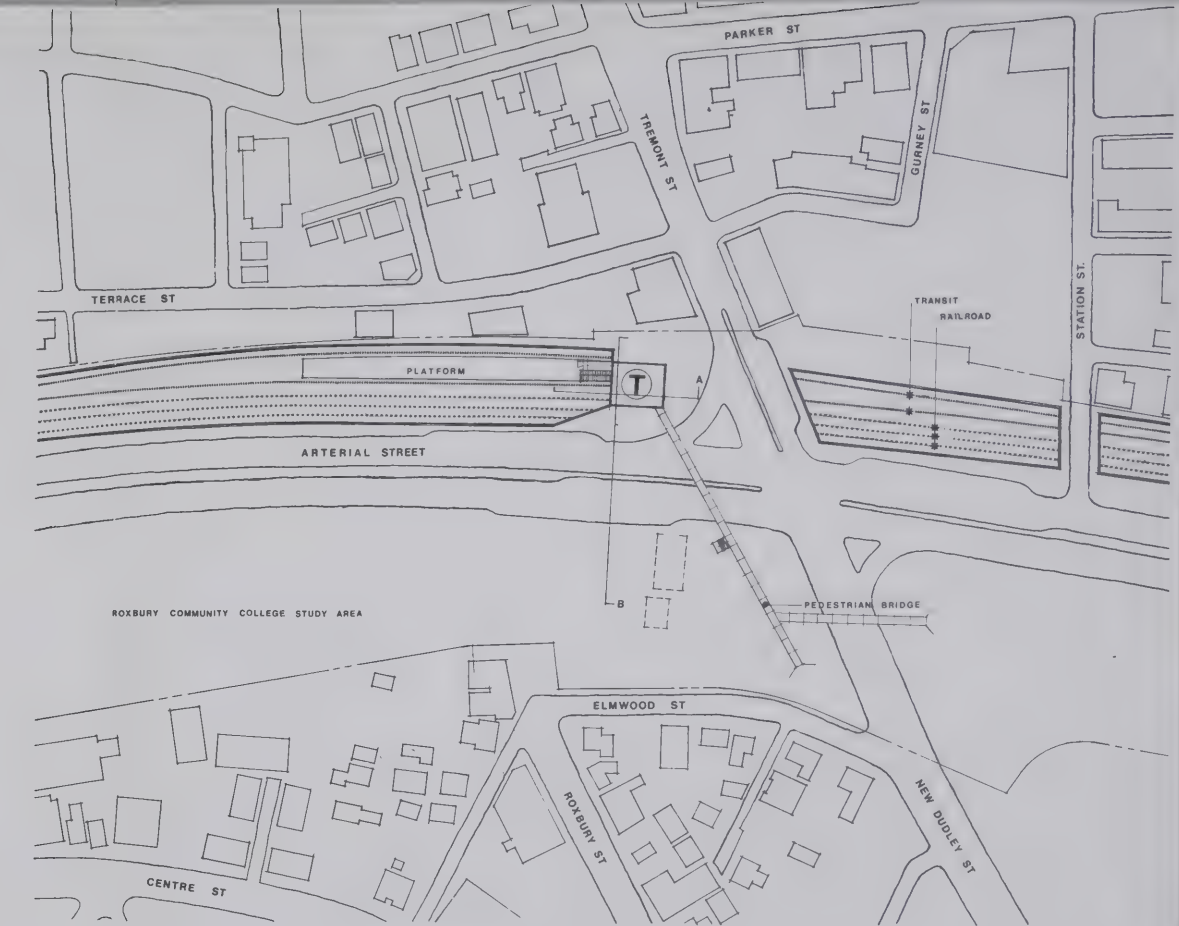
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

ROXBURY CROSSING STATION

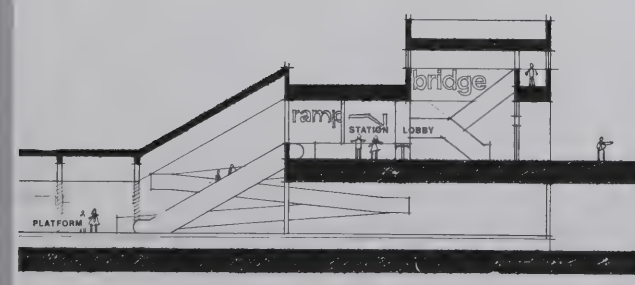
TRACKS DEPRESSED



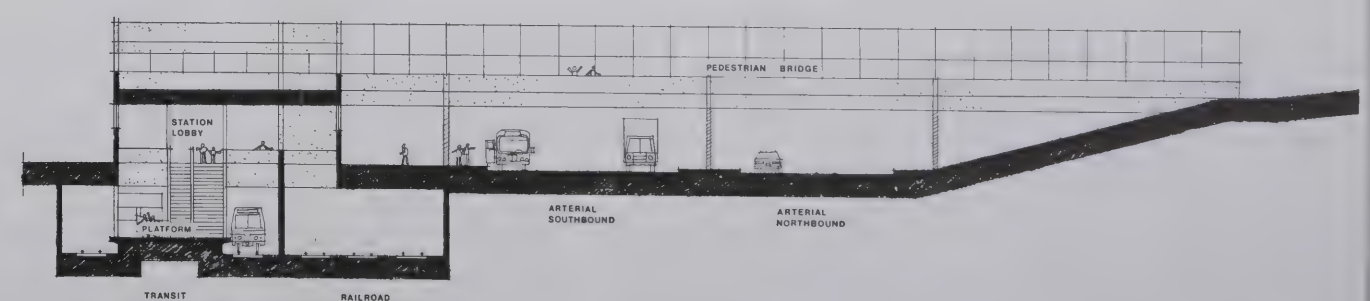
STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

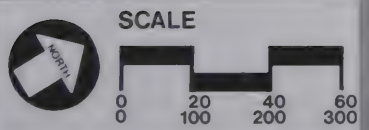


FIGURE
IV-78

FREDERIC R. HARRIS INC.



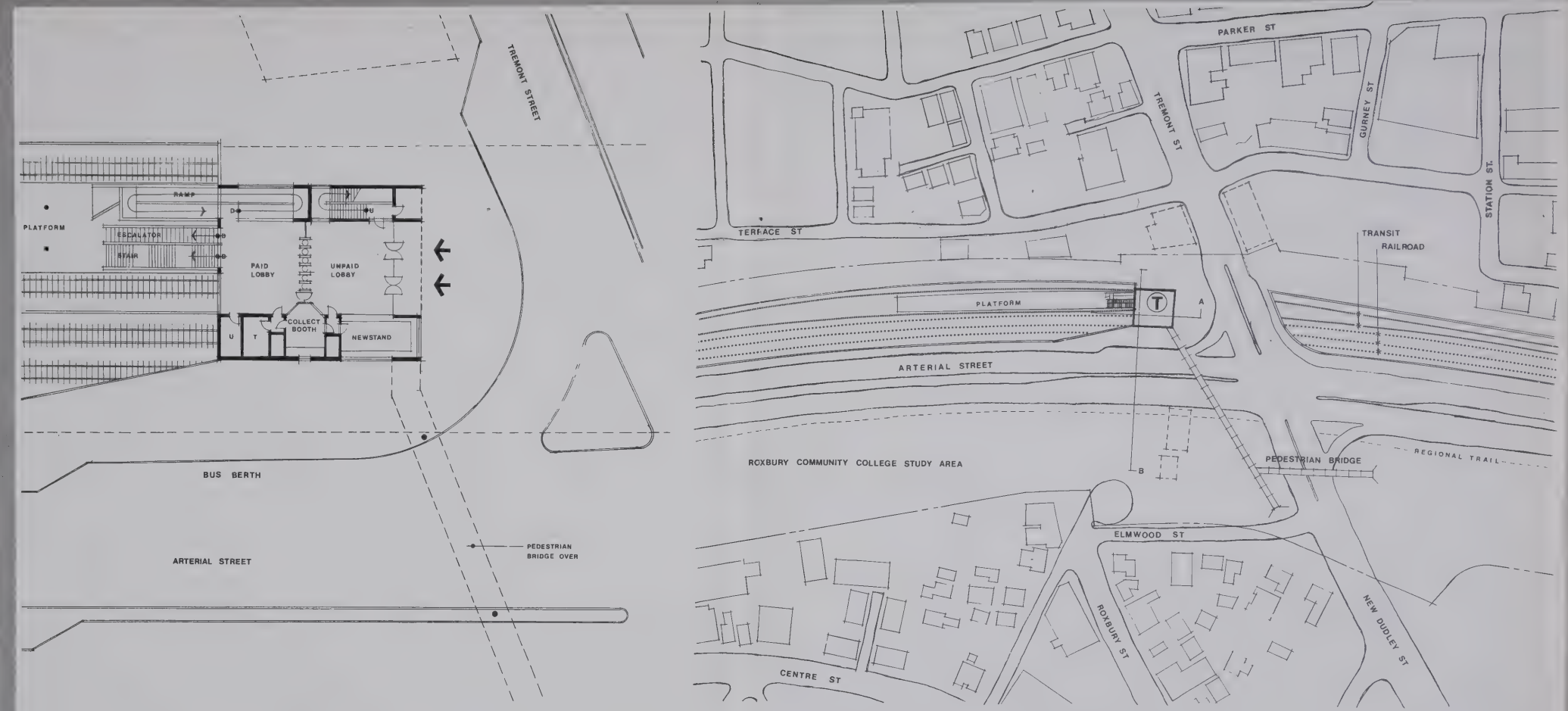
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

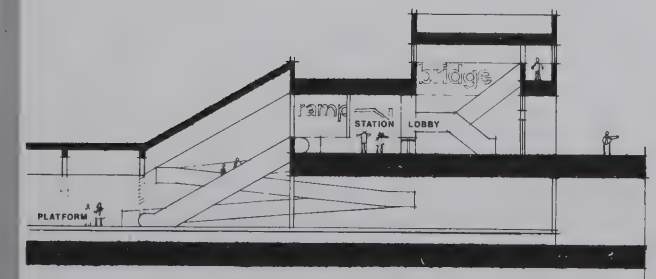
ROXBURY CROSSING STATION

TRACKS MODIFIED DEPRESSED

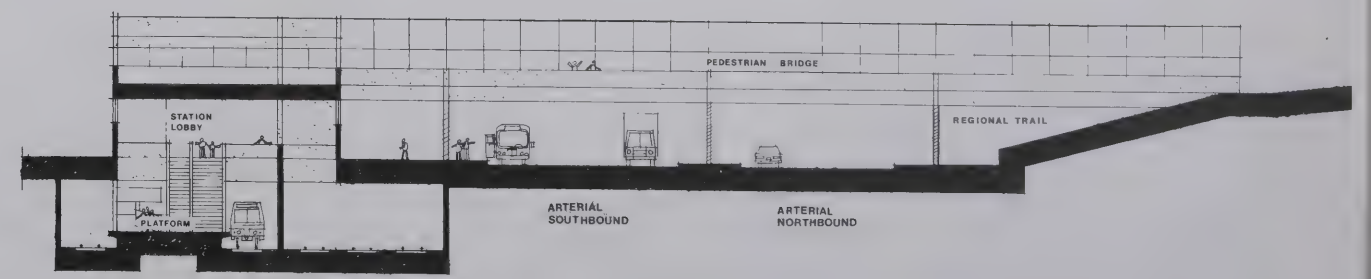


STATION PLAN

LOCATION PLAN



SECTION A



SECTION B

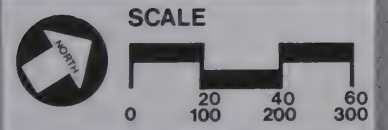


FIGURE
IV-79

FREDERIC R. HARRIS INC.

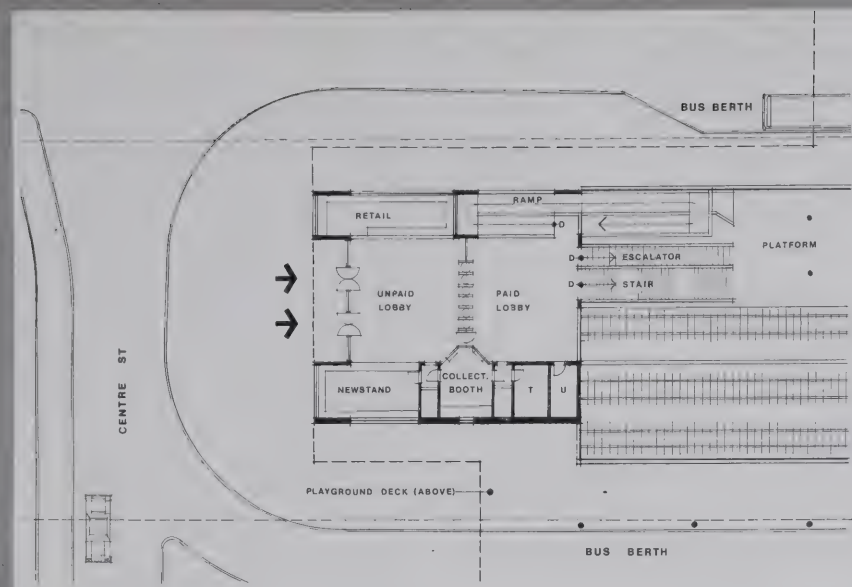
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

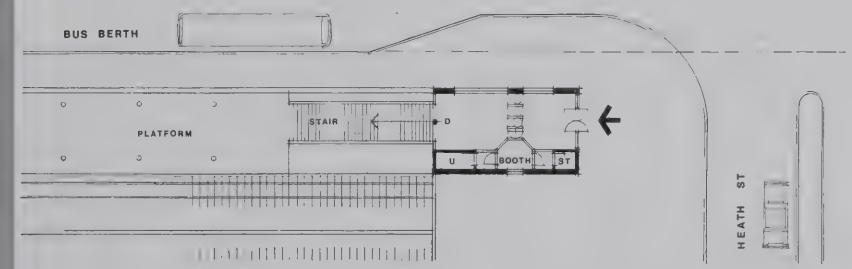
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

JACKSON SQUARE STATION

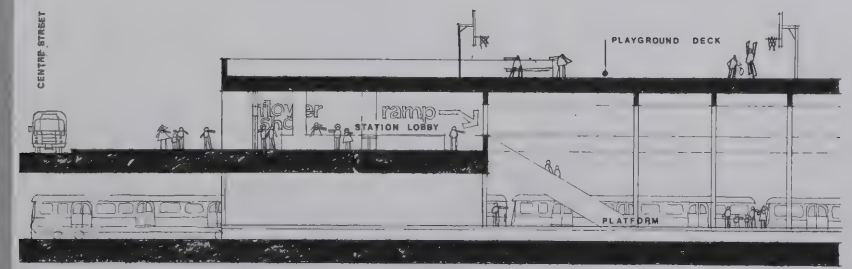
TRACKS DEPRESSED
ARTERIAL THROUGH



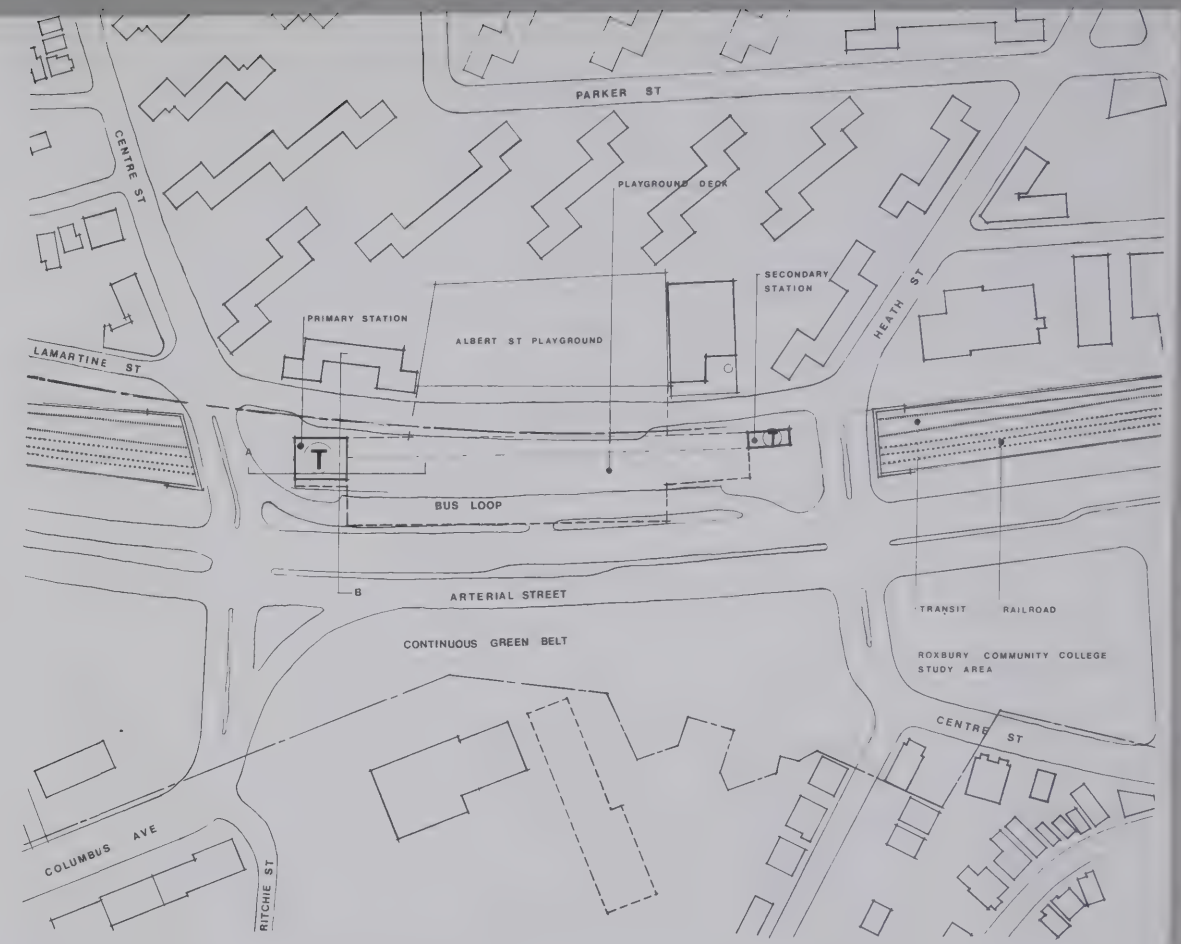
PRIMARY STATION PLAN



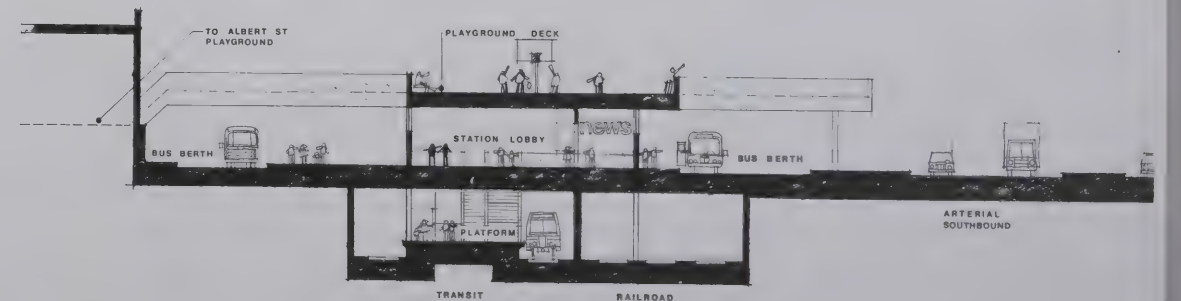
SECONDARY STATION PLAN



SECTION A



LOCATION PLAN



SECTION B

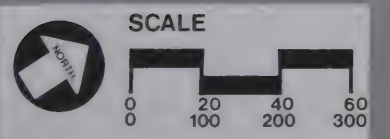


FIGURE
IV-80

FREDERIC R. HARRIS INC.

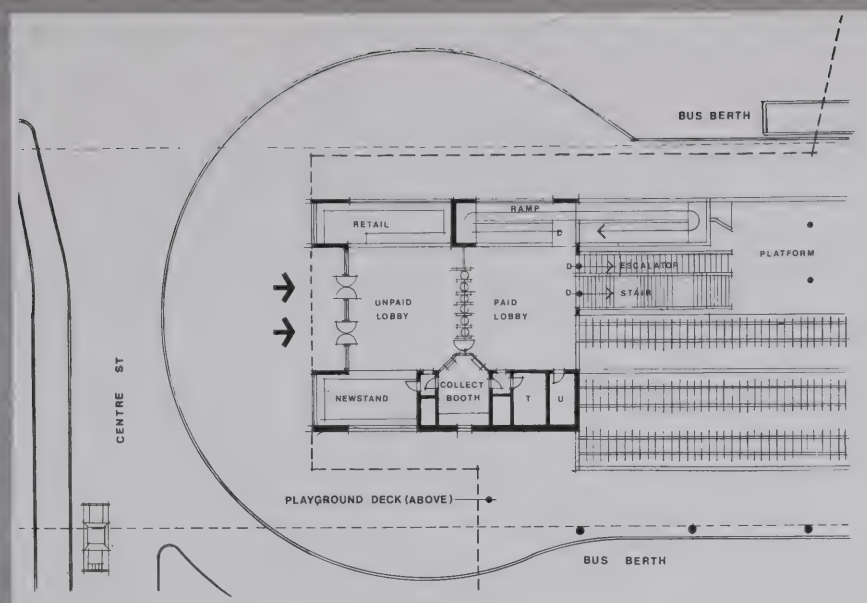
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

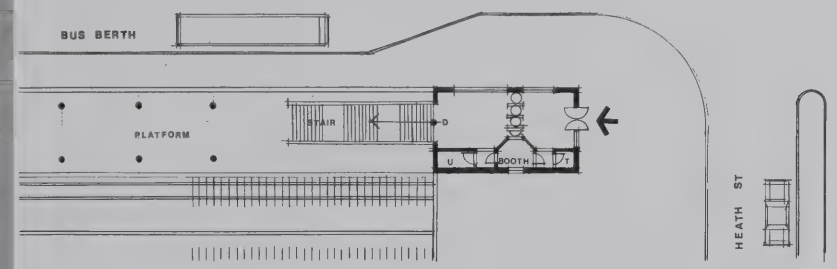
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

JACKSON SQUARE STATION

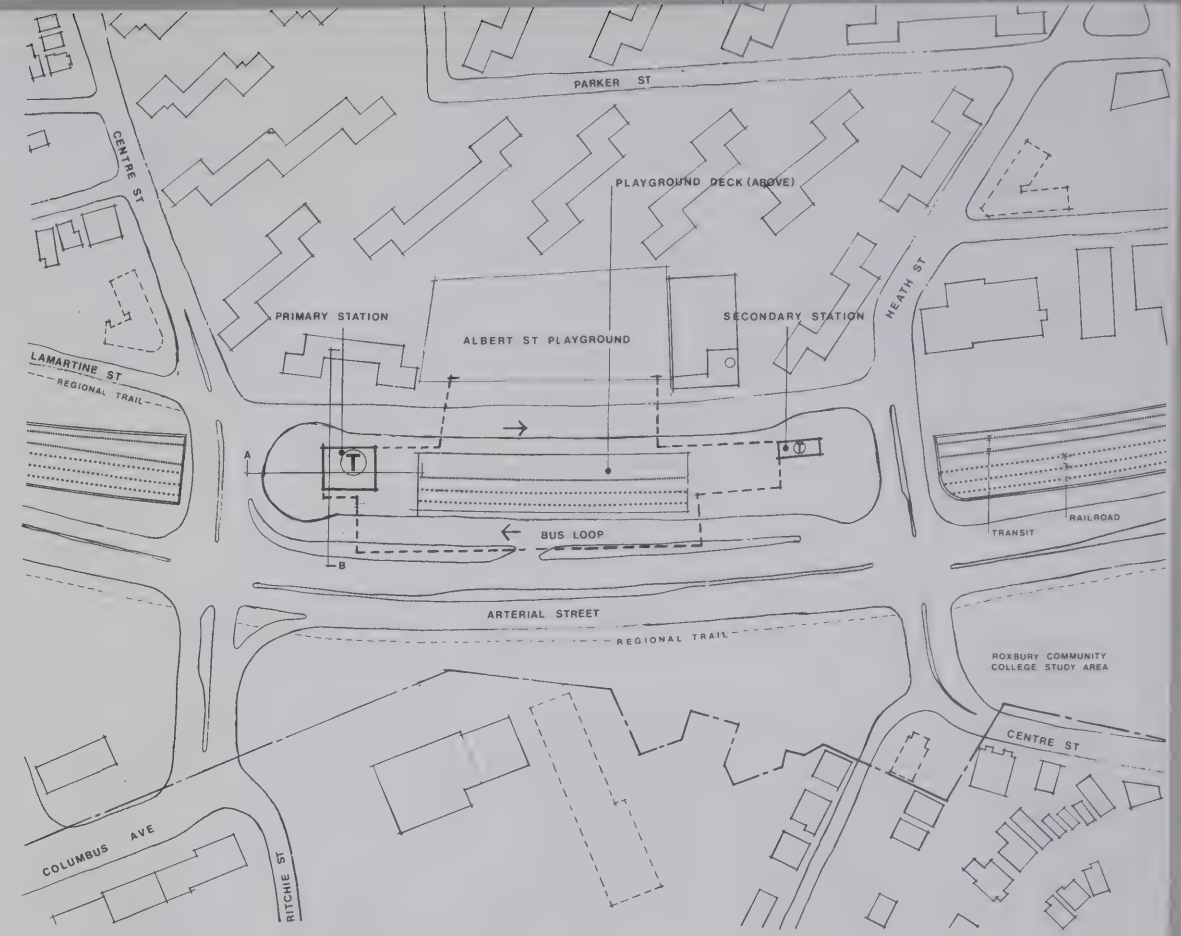
TRACKS MODIFIED DEPRESSED
ARTERIAL THROUGH
JACKSON SQUARE



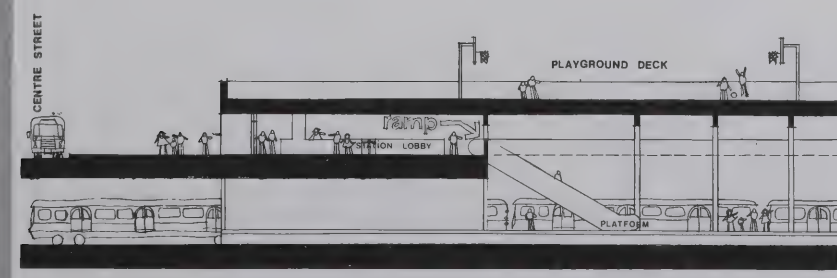
PRIMARY STATION PLAN



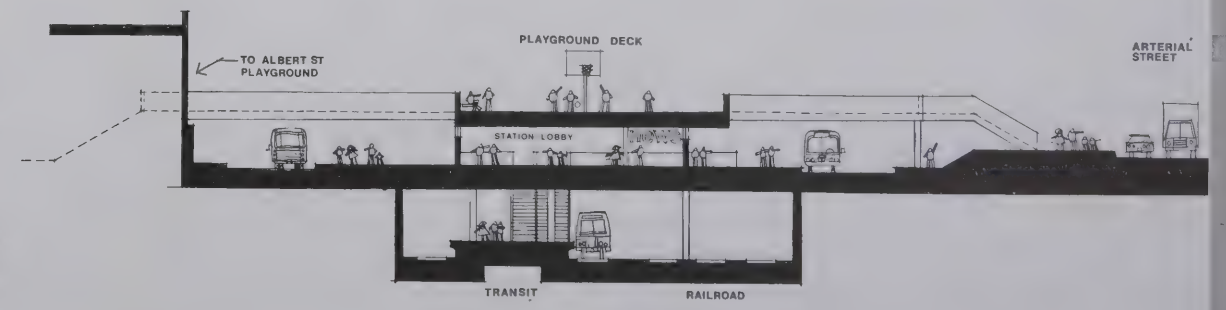
SECONDARY STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

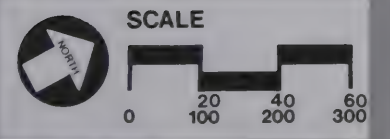


FIGURE
IV-81

FREDERIC R. HARRIS INC.

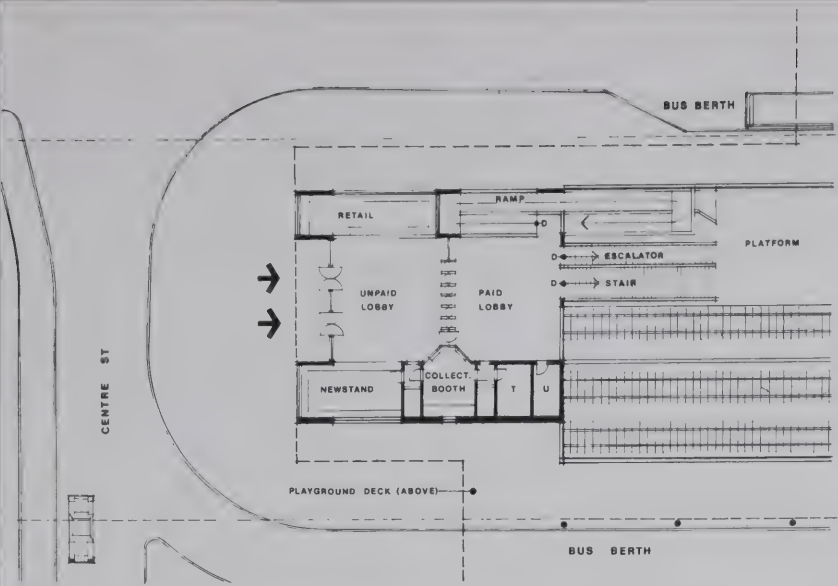
**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

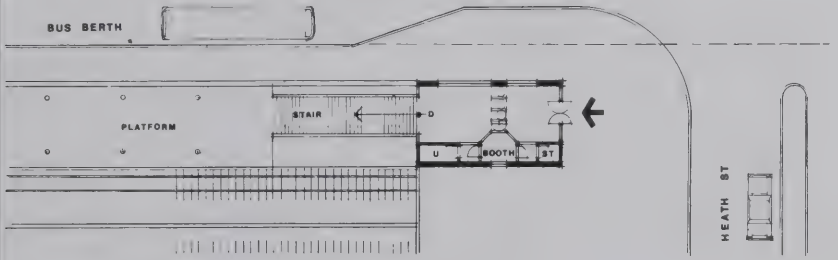
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**JACKSON SQUARE
STATION**

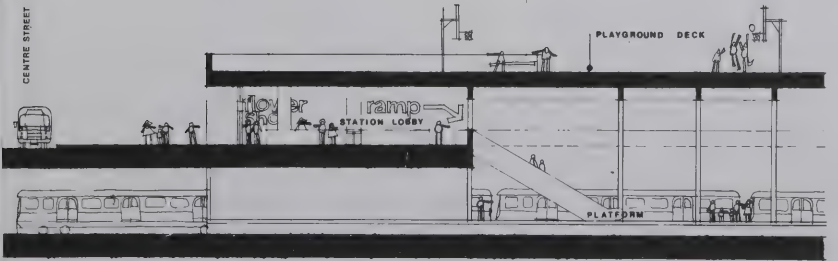
TRACKS DEPRESSED
ARTERIAL TO
JACKSON SQUARE



PRIMARY STATION PLAN



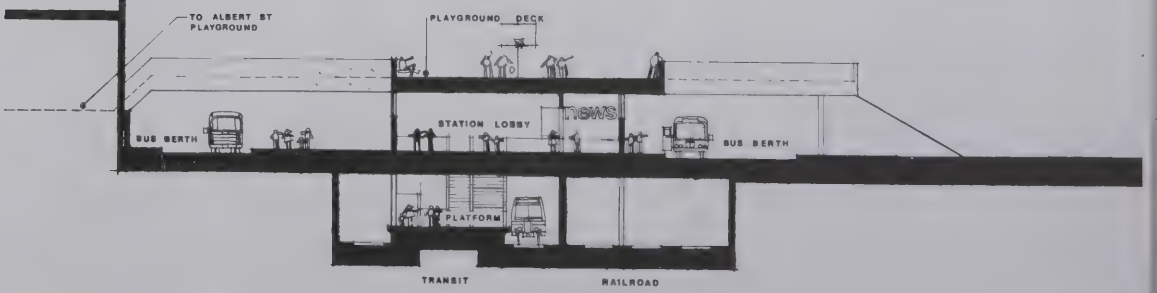
SECONDARY STATION PLAN



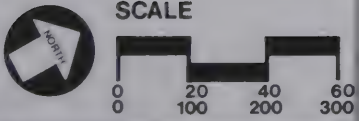
SECTION A



LOCATION PLAN



SECTION B



**FIGURE
IV-82**

FREDERIC R. HARRIS INC

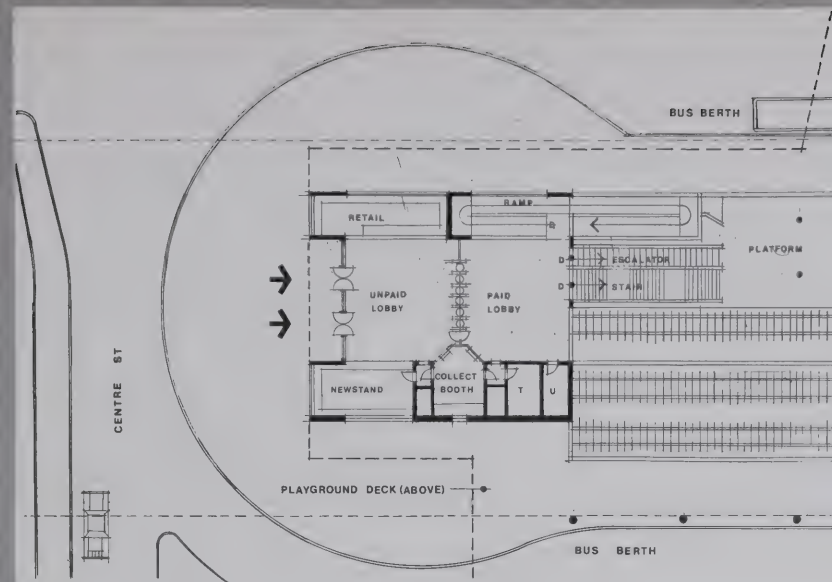
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

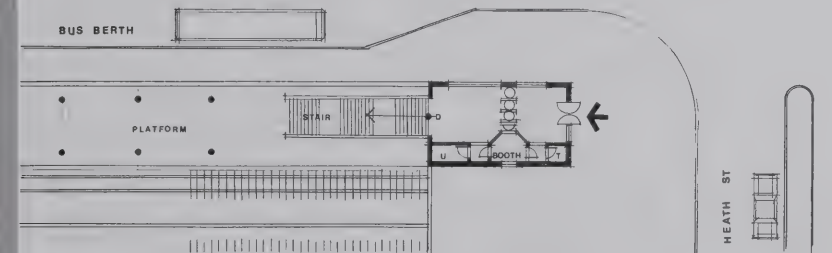
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

JACKSON SQUARE STATION

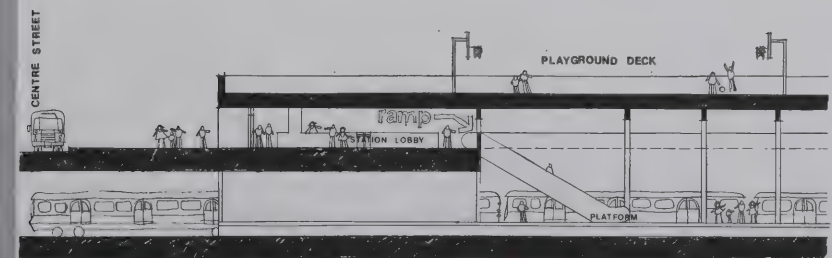
TRACKS MODIFIED DEPRESSED
ARTERIAL TO
JACKSON SQUARE



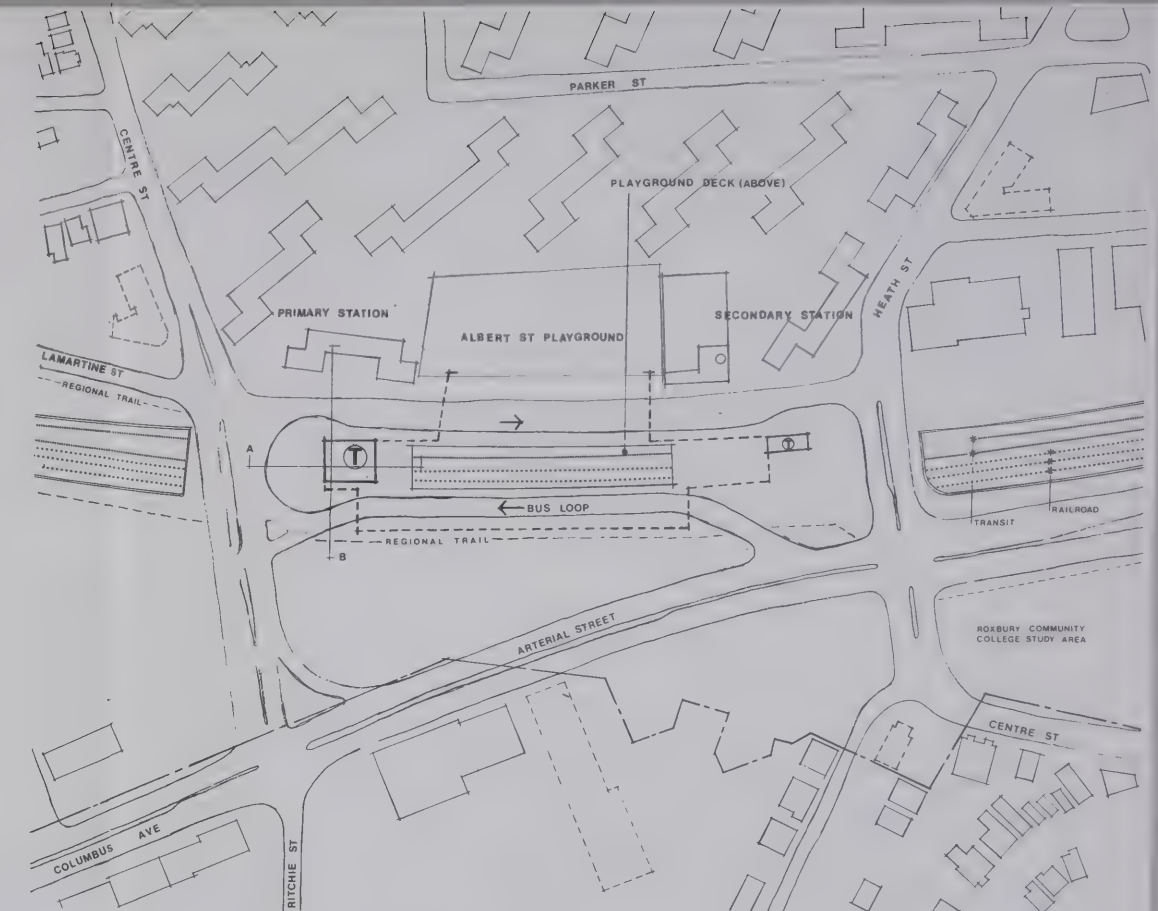
PRIMARY STATION PLAN



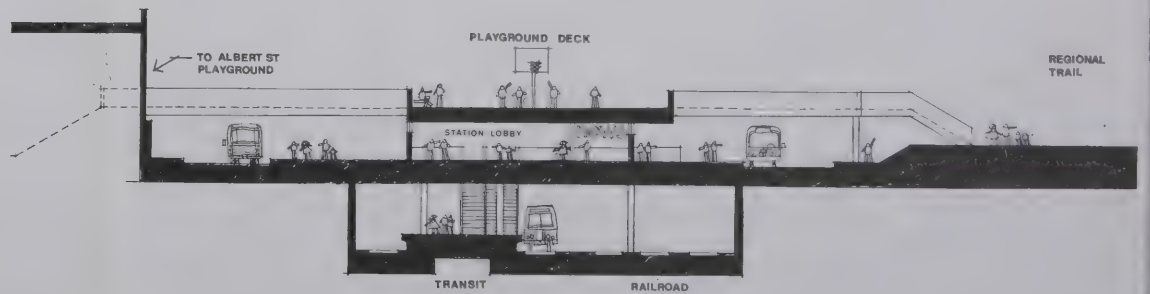
SECONDARY STATION PLAN



SECTION A



LOCATION PLAN



SECTION B

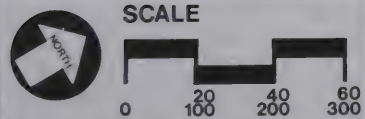


FIGURE
IV-83

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

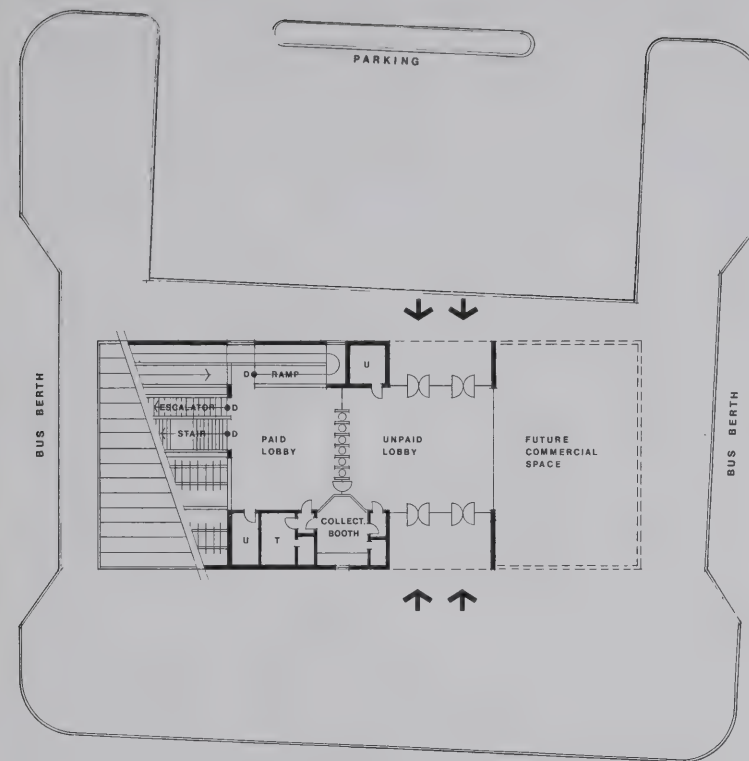
ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BOYLSTON STREET STATION

TRACKS DEPRESSED
ARTERIAL EAST

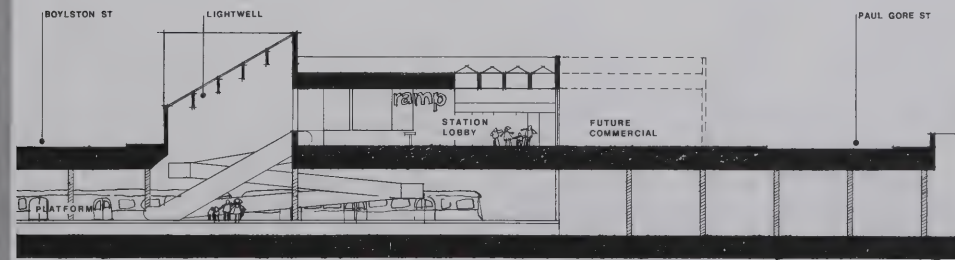
TRACKS DEPRESSED
NO ARTERIAL



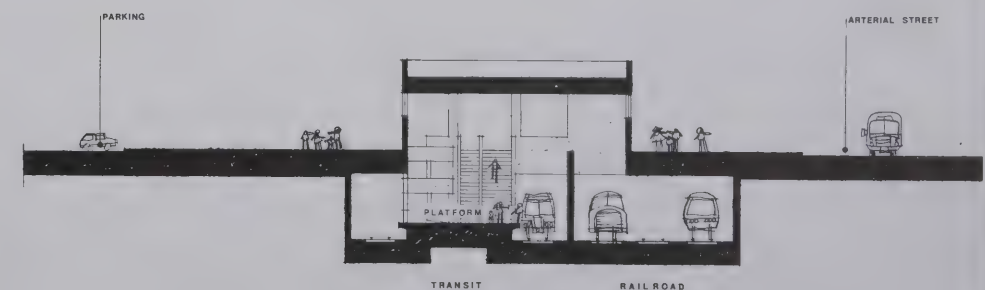
STATION PLAN



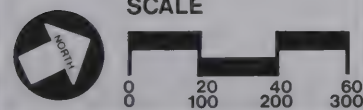
LOCATION PLAN



SECTION A



SECTION B



FIGURE

IV-84
(IV-86)

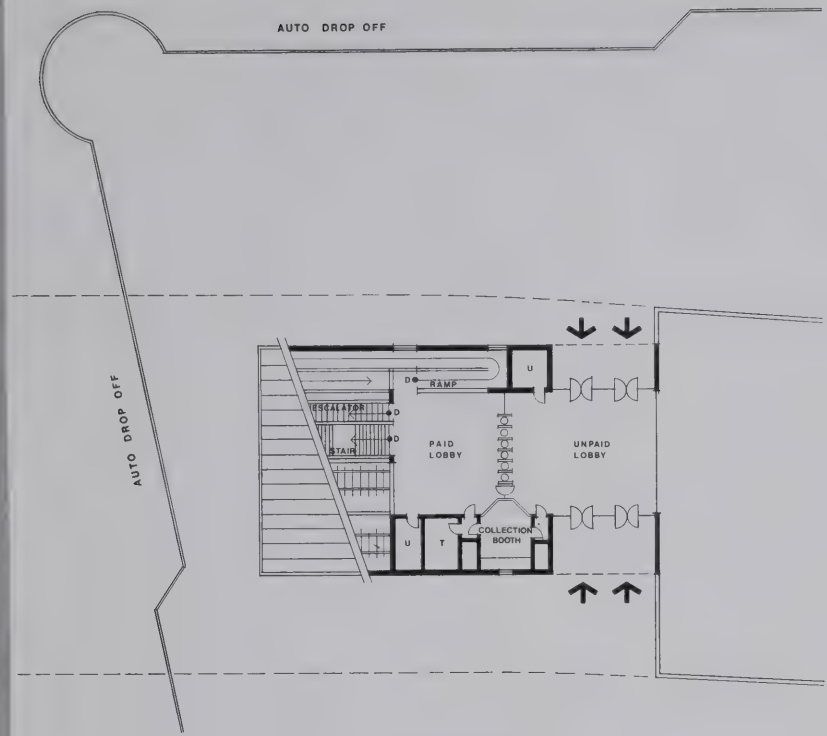
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BOYLSTON STREET STATION

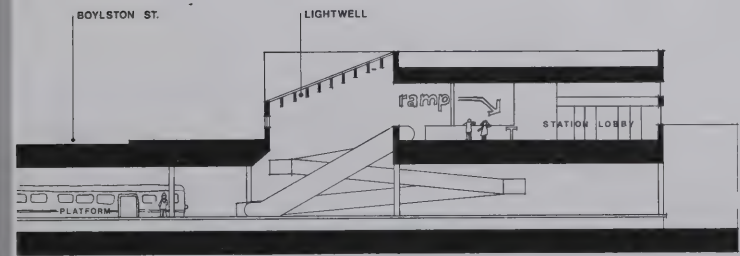
TRACKS MODIFIED DEPRESSED
ARTERIAL EAST



STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

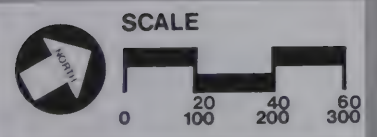


FIGURE
IV-85

FREDERIC R. HARRIS INC.

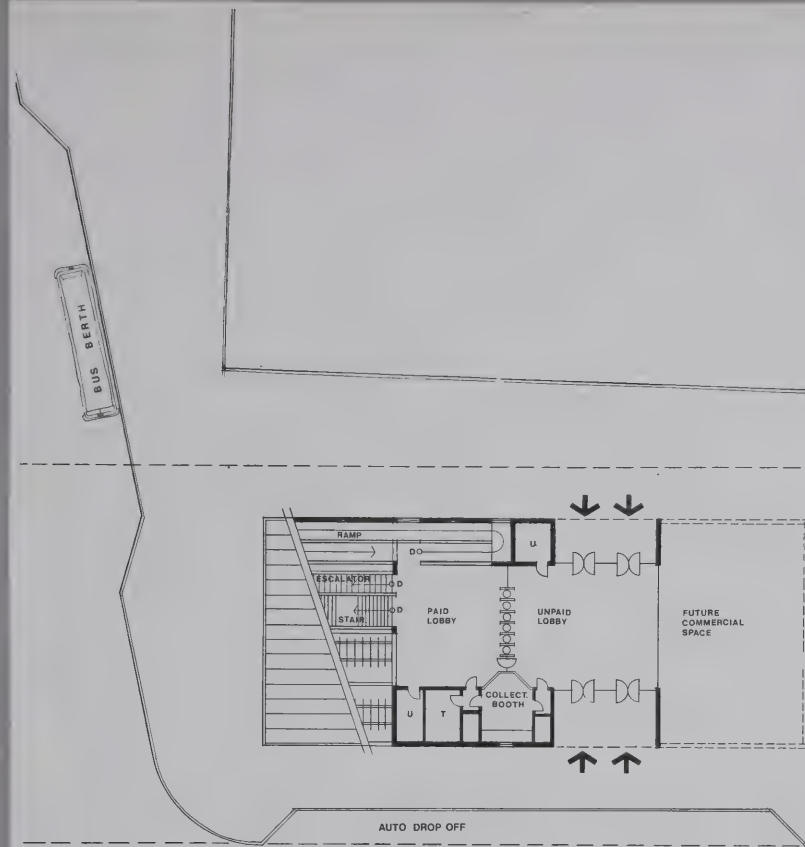
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BOYLSTON STREET STATION

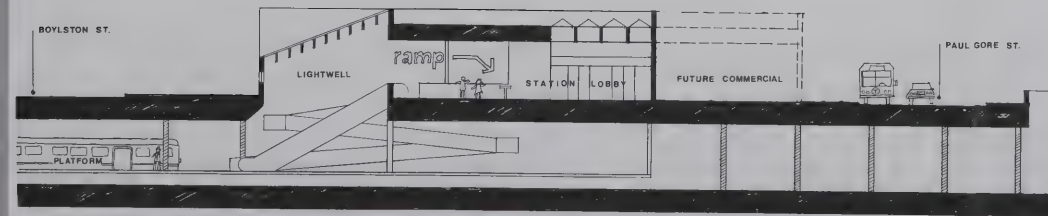
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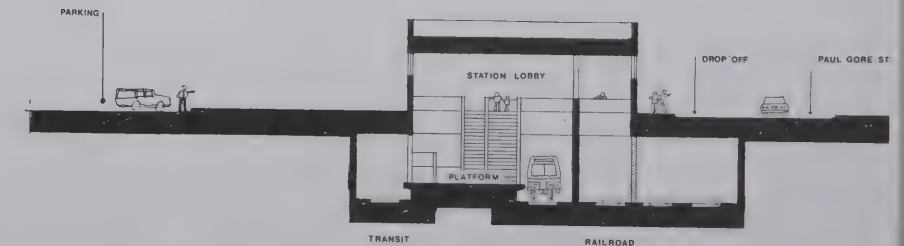
STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

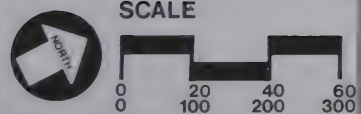


FIGURE
IV-86

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BOYLSTON STREET STATION

TRACKS MODIFIED DEPRESSED
NO ARTERIAL

STATION PLAN

LOCATION PLAN

SECTION A

SECTION B



SCALE



FIGURE
IV-87

FREDERIC R. HARRIS INC.

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

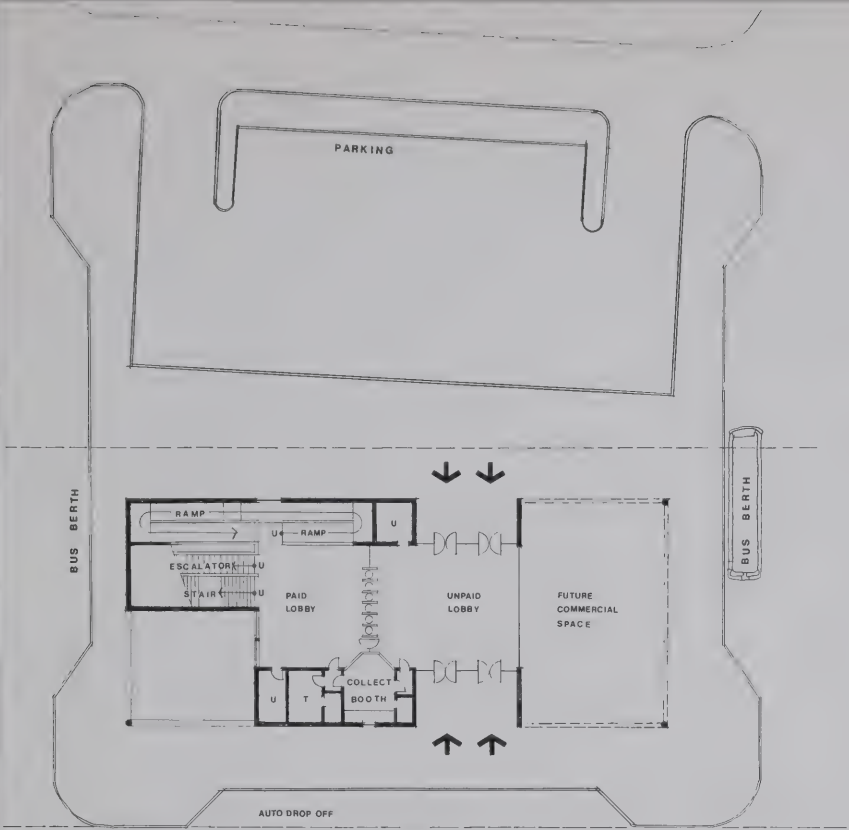
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**GREEN STREET
STATION**

**TRACKS ELEVATED
NO ARTERIAL**

ELEVATED PROTOTYPE FOR

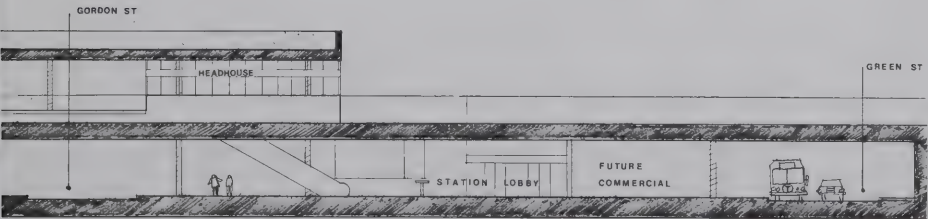
BOYLSTON ST
JACKSON SQUARE
ROXBURY CROSSING



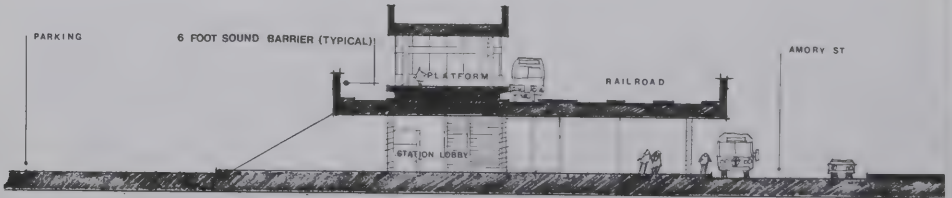
STATION PLAN



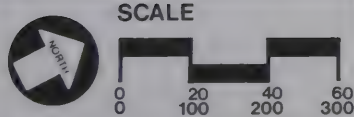
LOCATION PLAN



SECTION A



SECTION B



**FIGURE
IV-88**

FREDERIC R. HARRIS INC.

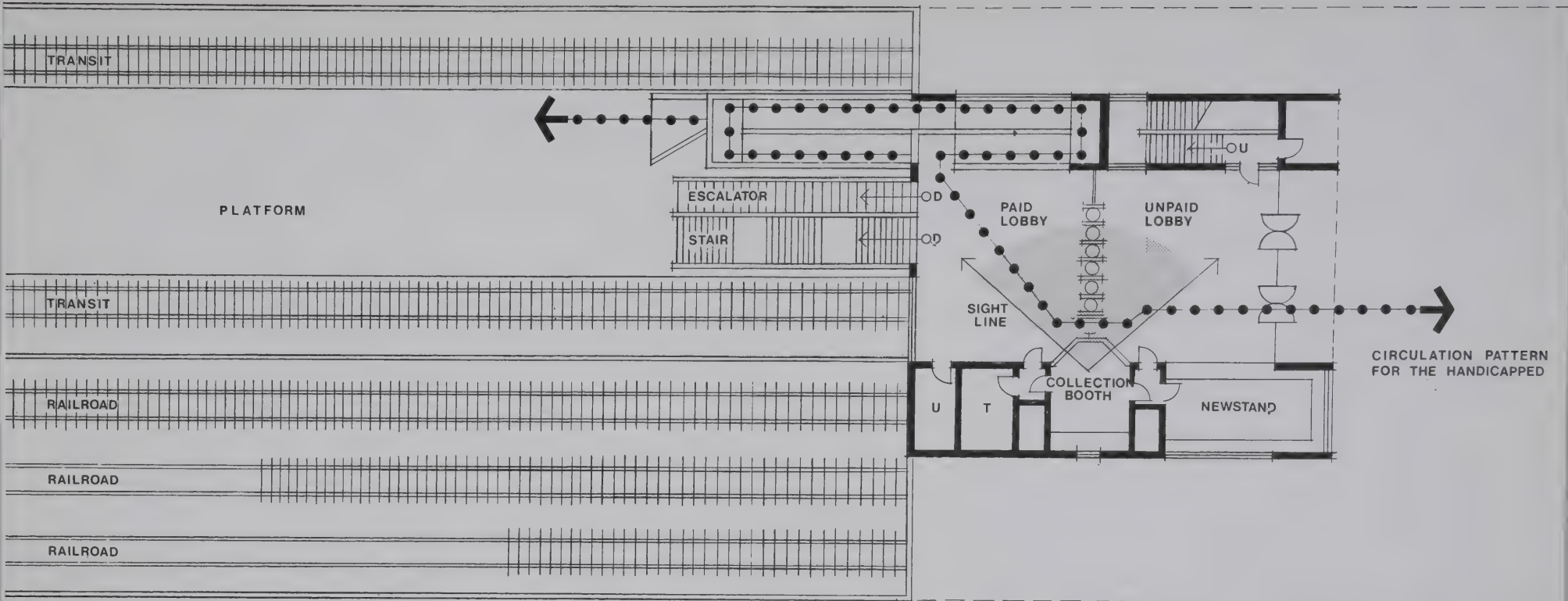
**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

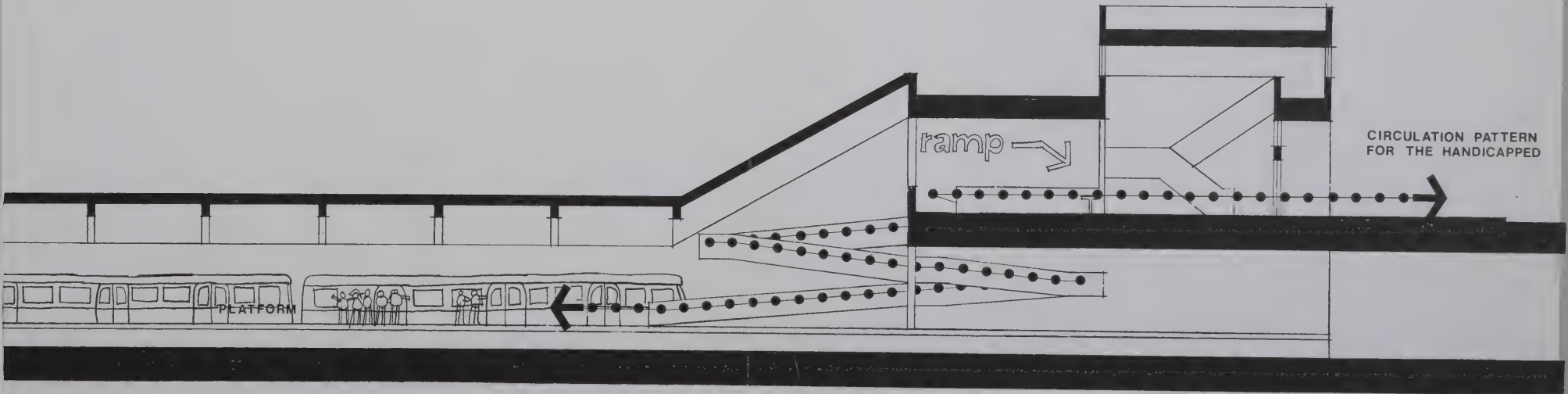
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

PROTOTYPICAL STATION

**CIRCULATION PATTERN
FOR THE HANDICAPPED**

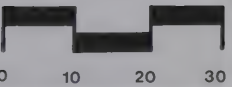


PLAN



SECTION

SCALE



FIGURE

IV-88A

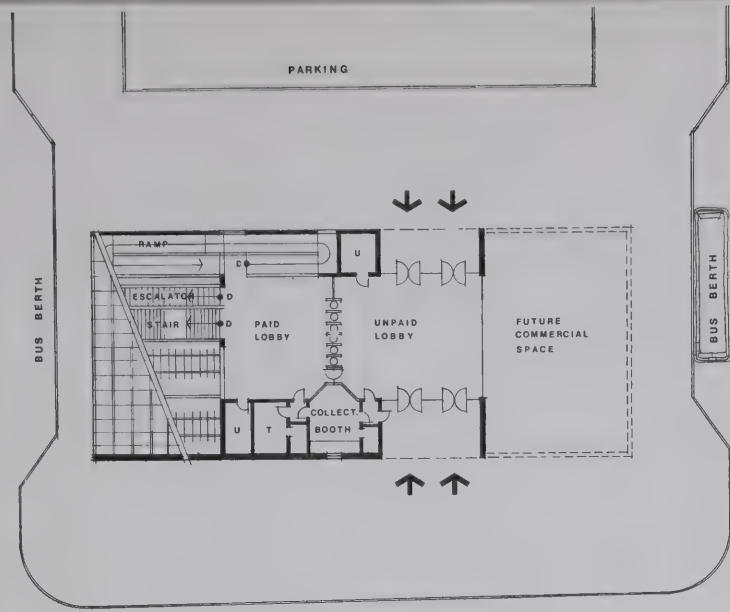
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

GREEN STREET STATION

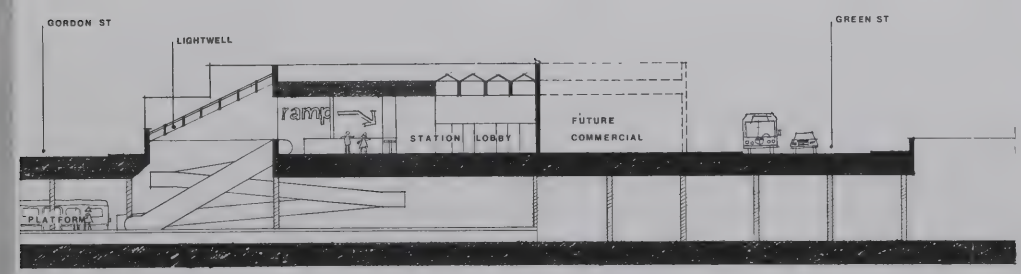
TRACKS DEPRESSED
ARTERIAL EAST
TRACKS DEPRESSED
NO ARTERIAL



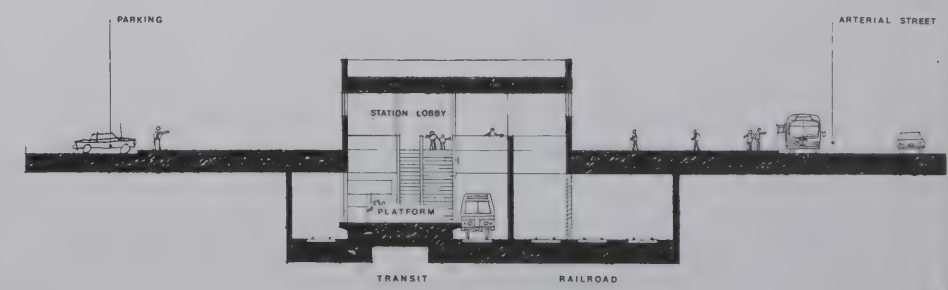
STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

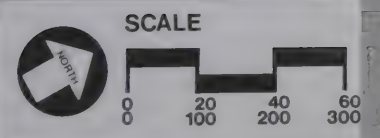


FIGURE
IV-89
(IV-91)

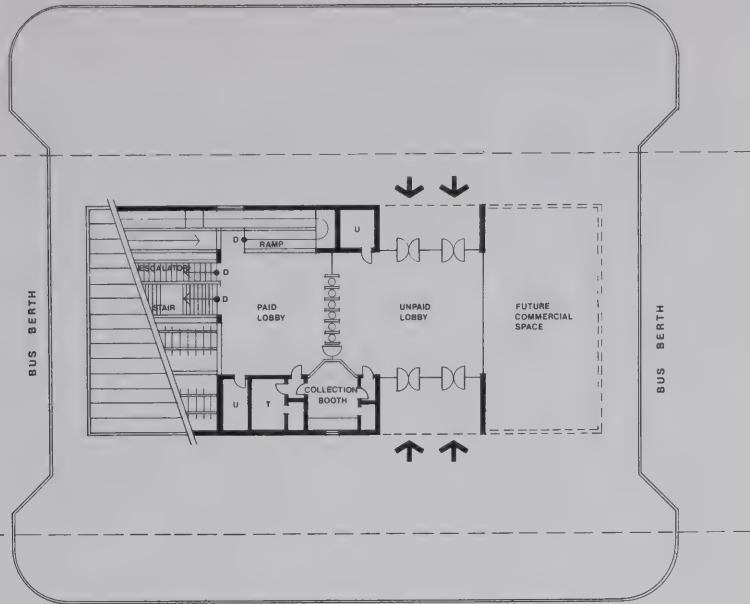
**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**GREEN STREET
STATION**

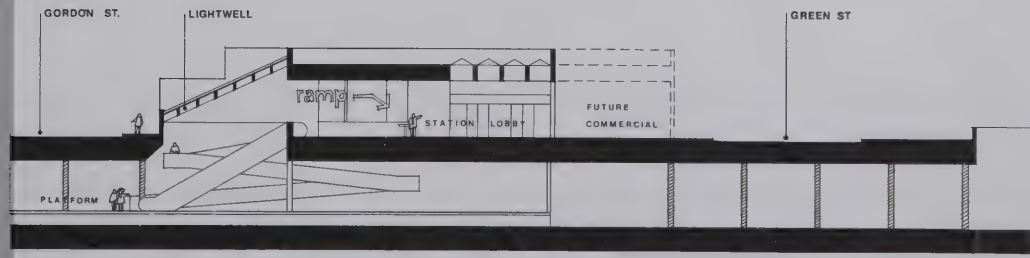
TRACKS MODIFIED DEPRESSED
ARTERIAL EAST



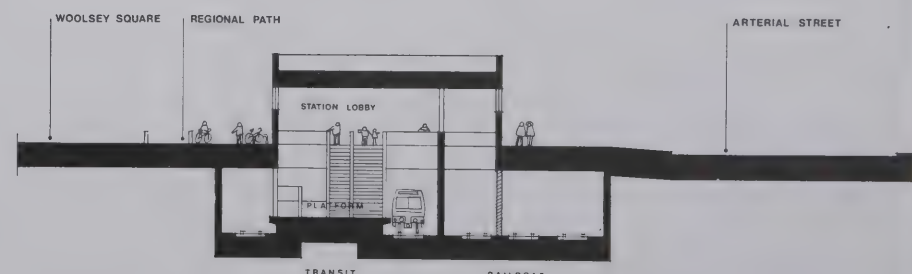
STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

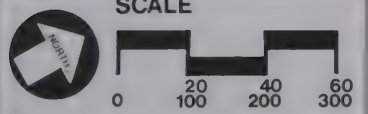


FIGURE
IV-90

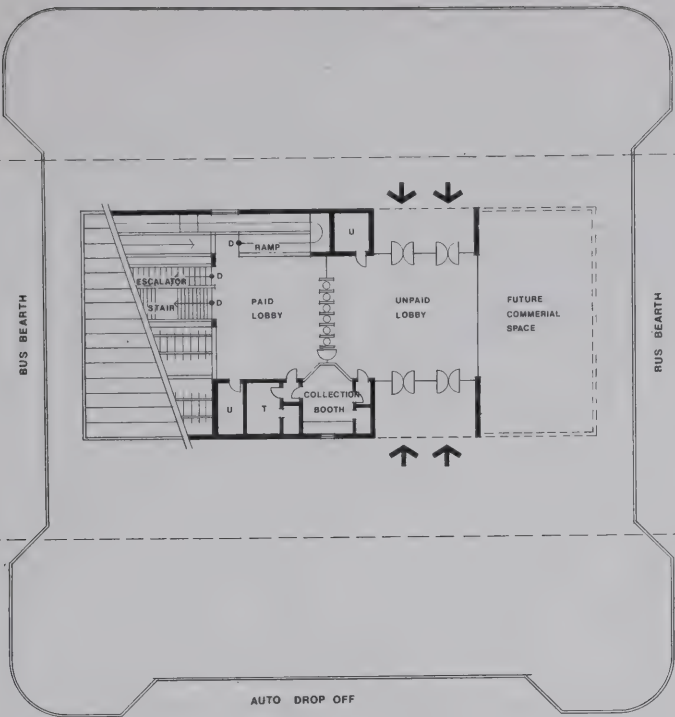
FREDERIC R. HARRIS INC.

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**
**ENVIRONMENTAL
IMPACT ANALYSIS**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**GREEN STREET
STATION**

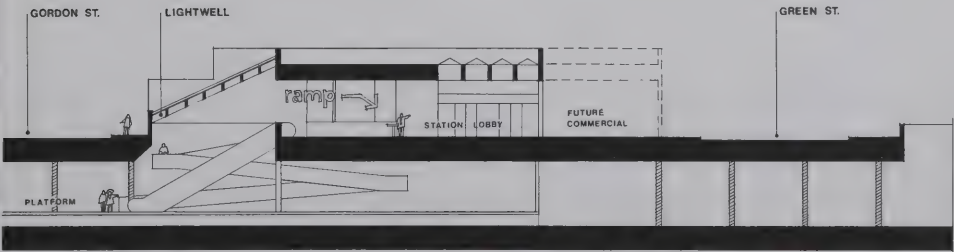
TRACKS MODIFIED DEPRESSED
NO ARTERIAL



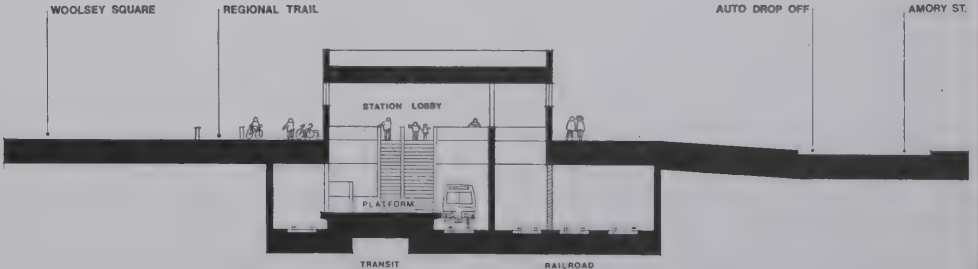
STATION PLAN



LOCATION PLAN



SECTION A



SECTION B

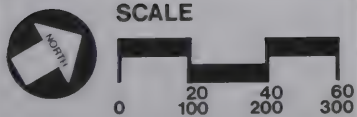


FIGURE
IV-92

FREDERIC R. HARRIS INC.

**SOUTHWEST CORRIDOR
TRANSPORTATION
IMPROVEMENTS**

**ENVIRONMENTAL
IMPACT ANALYSIS**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

**FOREST HILLS
STATION**

TRACKS ELEVATED

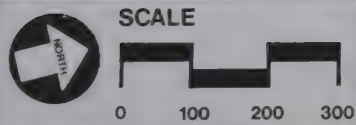
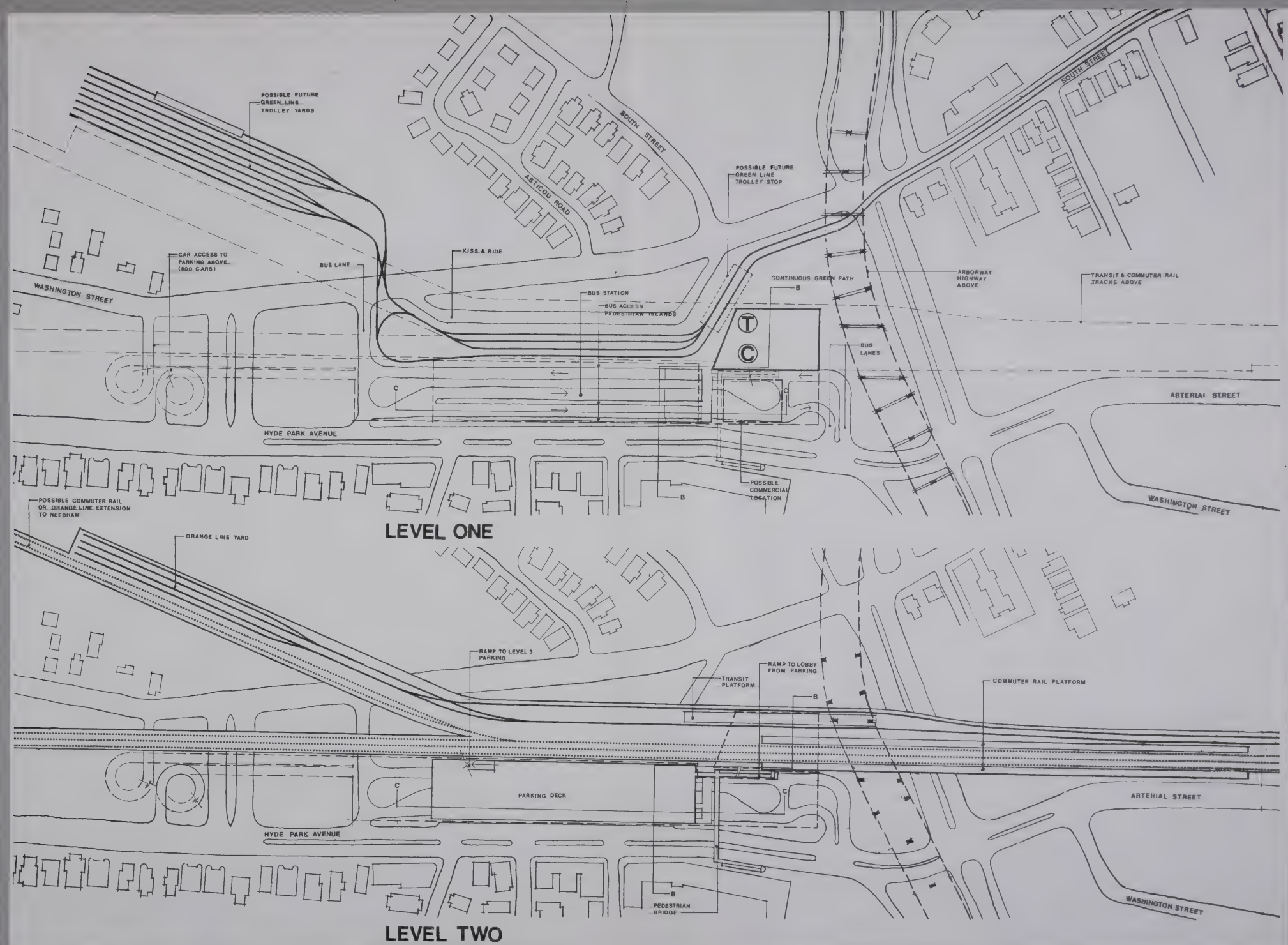


FIGURE
IV-93



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

FOREST HILLS STATION

TRACKS ELEVATED

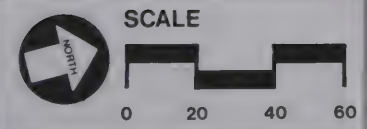
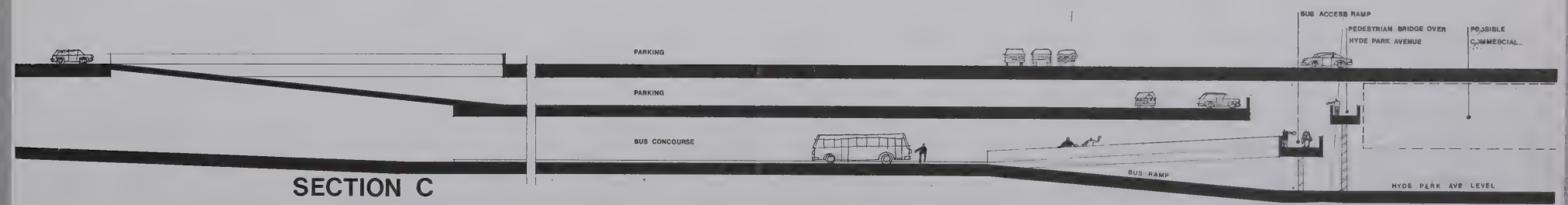
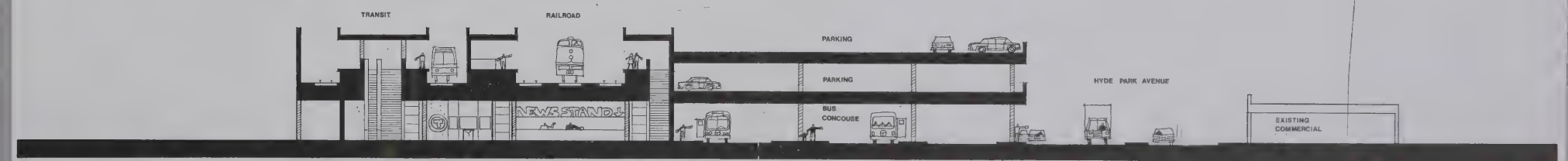
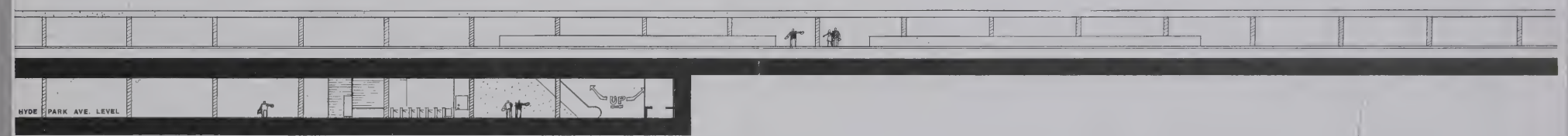
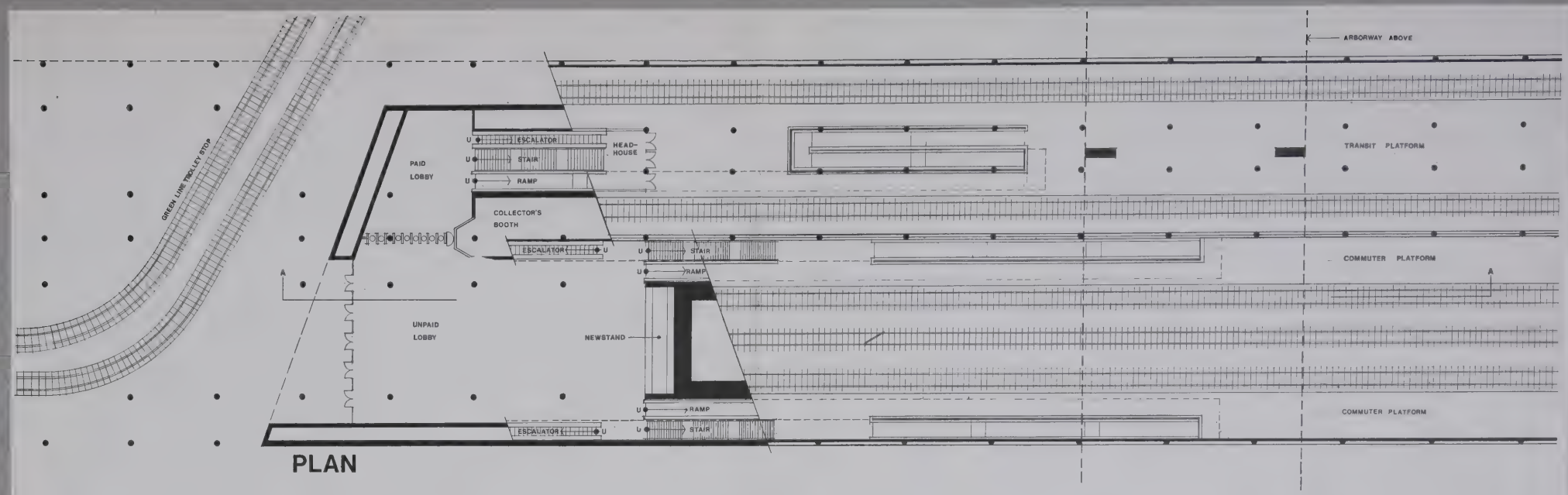


FIGURE
IV-94

FREDERIC R. HARRIS INC.

SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

FOREST HILLS STATION

TRACKS DEPRESSED

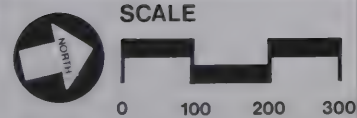
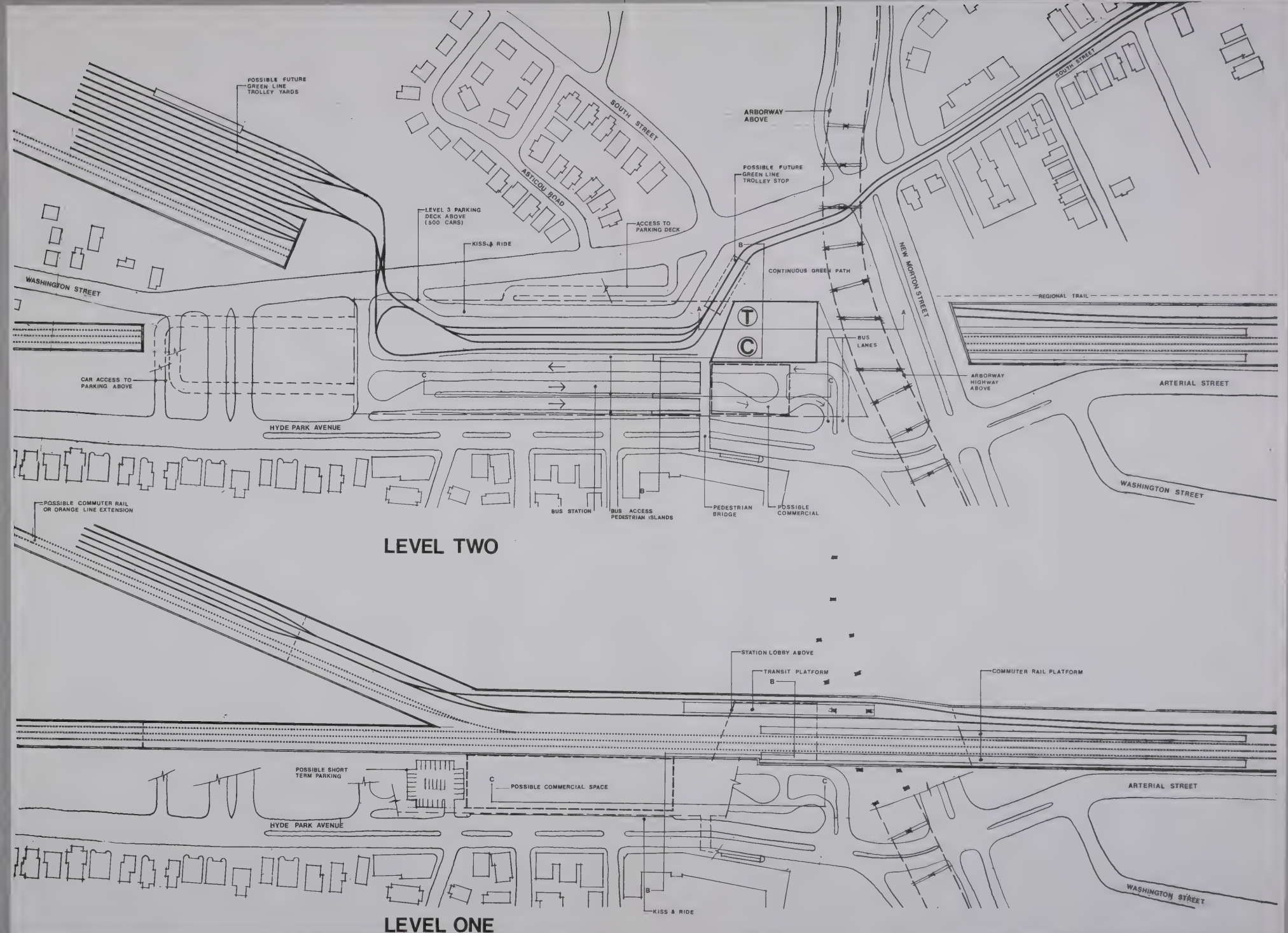


FIGURE
IV-95



SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

FOREST HILLS STATION

TRACKS DEPRESSED

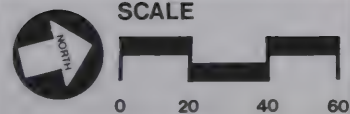
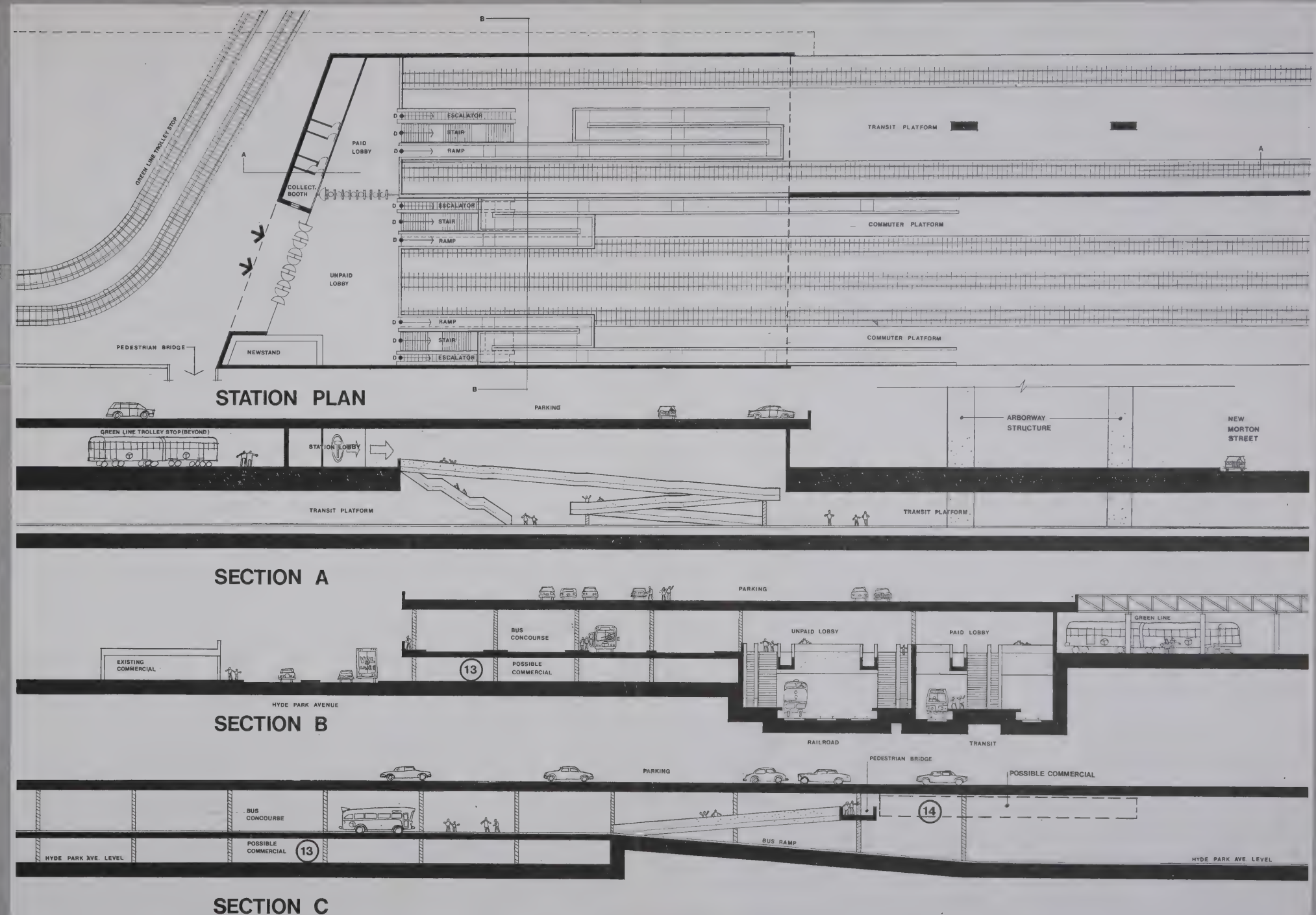


FIGURE
IV-96

FREDERIC R. HARRIS INC

4.5 Other Alternatives Studied

A complete set of alternatives (as well as options within those alternatives) was analysed during the study process. As a result, of preliminary analysis and after community review, certain alternatives were carried to a level of detail necessary for reasoned choices. For these alternatives, impact analysis was generated only to that degree considered adequate for decision-making purposes. Other major alternatives studied include:

4.5.1 Improvements to Washington Street Elevated

Structural analysis conducted in 1973 revealed that the entire 4.3-mile length of the structure was in urgent need of repair and painting. The structure which is more than 70 years old received its last major painting in the early 1940's.

The nature of the repairs, begun in 1973 and currently underway, included reinforcing of structural components and connections, painting and general maintenance. In all, 2.6 million dollars was programmed for the structural rehabilitation completed in 1974. In addition, a 2.4 million dollar painting contract was funded and is currently underway with completion scheduled for December 1976. Station rehabilitation is also being undertaken at a cost of 1.5 million dollars. A track-realignment project, south of Dudley Station is being considered in order to provide better curvature needed to accommodate longer cars and to permit street improvements below. The realignment cost is set at \$600,000.

The repairs already undertaken as well as others programmed for the near future should provide for the integrity of the structure for up to 10 years.

Measures which would reduce the noise and vibration levels of the elevated line, though possible to construct, have minimum influence on the environmental system. Noise attenuation devices attached to the lateral and underside of the structure, would cause reductions in noise levels along Washington Street (10-15dB), and virtually no reduction in noise levels above track grade. Structural complications, however, are inherent in this system due to the additional weight of the noise barriers, compounded by increased ability to attract snow and wind loadings. Additionally, the environmental price to pay for this reduction in noise is loss of sunlight. Sunlight is already a scarce commodity on Washington Street due to the elevated structure.

Noise and vibration can also be reduced (5-10 dB) through the use of continuously welded rail, resilient fasteners and a continued maintenance program of wheel truing and rail grinding. The installation of continuously welded rail and resilient fasteners, however, is not considered feasible while simultaneously maintaining Orange-Line operations uninterrupted. Additional stresses would also be introduced in the "EL" structure.

FIG. IV-97 represents a comparison of the primary parameters for consideration of this alternative.

IMPROVEMENTS TO WASHINGTON ELEVATED

Benefits

Lower noise level by 15-25 dB at street level

Increased structural integrity

Reduced corrosion and "rust drop"

Replacement service would not be a requirement if existing station spacing is adequate

Entire Penn Central right-of-way would be provided for intercity and commuter rails

Disbenefits

Noise levels above track grade not reduced

Further decreases in sunlight

Major structural modifications required for extended use would necessitate interrupted Orange-Line Service

Construction impacts:

- rust scrapings
- paint spatter and odor
- traffic disruption
- interrupted Orange-Line Service
- increased noise
- material hauling

Increased structural loads and therefore reinforcement and new structure drainage system required due to noise barriers

Back Bay and South Cove areas would not be served by rapid transit. There would be no direct connection from AMTRAK and Commuter rail to the Orange Line downtown distribution system.

Does not provide for direct connection from Amtrak and Commuter rail to North Station area

Reduces viability of developing land cleared for I-95 south

13.3 million dollars existing South Cove tunnel would not be utilized

Continued use of portal would preclude planned expansion of Tufts N.E. Medical Center and new housing in South Cove Urban Renewal Center. Existing vibrations would continue to impact Medical Center Laboratory.

Frequent local South End service on Washington Street (stops every 2 to 3 blocks) would not be feasible due to elevated line.

Redevelopment of land and structures on Washington Street remains difficult

Less incentive to provide major service improvements to transit dependent Roxbury/Dorchester/Mattapan

IMPROVEMENTS TO WASHINGTON ELEVATED (continued)

Benefits

Disbenefits

No improvements (noise reduction) to Penn Central Mainline railroad alignment would accrue as a part of transit project

Reconstruction of the Penn-Central Mainline embankment still required.

4.5.2 Subway under Washington/Shawmut

Reconstruction of the Orange Line in a subway basically in the vicinity of its current alignment was studied in detail with factors listed in FIG. IV-98. A discussion of those factors is included here. Detailed engineering studies are presented in the Appendix. In addition, information relating to ridership, user benefit and operating costs is contained in Section 4.4.1.4.

All of the subway alternatives would connect to the new South Cove tunnel and station. These alternatives included:

South Cove to Dudley

- Twin shield-driven, single-track tunnels under Shawmut Avenue.
- Shield-driven, single-track tunnels under Washington Street and Shawmut Avenue ("one-way pair").
- Cut-and-Cover subway under Shawmut Avenue.
 - Side-by-Side
 - Under-and-Over
- Single shield driven, twin-track tunnel under Washington or Shawmut.

Dudley to Forest Hills

- Twin-shield driven, single-track tunnels under Washington Street.
- Single-shield driven, twin-track tunnel under Washington Street.
- Cut-and-Cover subway under Washington Street.

4.5.2.1 Subway Route Description

The engineering feasibility of constructing an underground rapid-transit facility, while maintaining the existing Orange Line in operation, was studied for the construction methods and alignments listed above.

A refined alternative was selected which basically splits inbound and outbound transit service between East Berkeley Street and the general vicinity of Dudley Square. Both Washington Street and Shawmut Avenue are utilized to accomplish this. South of Dudley inbound and outbound Orange Line would be in the same basic alignment under Washington Street. The initial portion of the route would consist of twin shield-driven single-track tunnels (Fig. IV-99, Detail A). A station is proposed at East Berkeley Street, the narrow width of Shawmut Avenue precludes tunneling of two separate tunnels without incurring extensive underpinning for all abutting properties on both sides of the street. (Fig. IV-99, Detail B)

An alternative of twin track, cut-and-cover double box construction was also studied for this segment. This form of construction would require that the street would be completely disrupted from curb to curb, and would also entail extensive utility relocations (Fig. IV-99, Detail C). Further more, station layouts for side and center platform arrangements would only be feasible if the entire street width (from building line to building line) were disrupted, and platform widths less than desirable would have to be adopted.

(FIG. IV-98)

SUBWAY UNDER WASHINGTON/SHAWMUT

Benefits

Removal of Orange Line Elevated
 -eliminate major source of noise
 -eliminate major source of vibrations
 -eliminate blighting influence of structure
 -improve traffic operations and safety on Washington Street

Replacement service would not be a requirement if existing station spacing is adequate

Entire Penn Central right-of-way could be provided for intercity and commuter rail

Reduced running times for Orange Line transit

Lower operating and maintenance costs (\$2 million/yr. less) of subway compared to elevated

Disbenefits

Construction impacts
 -cut-and-cover south of Dudley
 -all material entering and leaving site must be hauled through communities by truck
 -property takings
 -traffic disruption
 -estimated cost \$370,000,000
 -temporary noise impacts

Operational deficiencies
 -under-and-over station at Dudley
 -separation of inbound from outbound transit north of Dudley Station

Back Bay and South Cove areas would not be served by rapid transit. There would be no direct connection from AMTRAK and commuter rail to the Orange Line downtown distribution system

Reduces viability of developing land cleared for I-95 south

Alternative does not create a significantly expanded ridership market compared to project cost

Lower user benefit for subway as compared to relocation of Orange Line to P. C. Corridor (\$3.4 million/yr. travel time savings vs. \$4.8 million/yr.)

Reconstruction of Penn-Central Mainline embankment still required for AMTRAK.

Twin-track single-shield construction was also studied for this line segment. This option, though less threatening to the building foundations along Shawmut Avenue, would require property taking at stations.

For these reasons, the most feasible alternative is to tunnel under Shawmut Avenue using a single shield-driven tunnel (Fig. IV-99, Detail D) outbound to Roxbury Street where Shawmut Avenue ends (at Dudley Square) and locate the inbound track on Washington Street (Fig. IV-99, Detail E).

The two tracks would then come together at Roxbury Street and Shawmut Avenue where the Dudley Square station would be relocated.

South Dudley Square, the route alignment would continue along Washington Street in an over-and-under double-box cut-and-cover arrangement because of the narrow curb-to-curb width of Washington Street in this reach (Fig. IV-99, Detail F). The over-and-under double-box arrangement would continue to Marcella Street at which point Washington Street widens out sufficiently to permit a twin-track box arrangement side-by-side. The side-by-side arrangement would continue to the end of Washington Street. A new Forest Hills station would be constructed below grade south of the point where the Arborway crosses the present elevated Orange Line. At this location the relocated route centerline would be shifted west of the present trackage. South of the Forest Hills Station a turnaround and switchback track could be utilized to connect the station to the present storage yard and shop area located at or above street grade. Provisions can also be made at this point to extend the route trackage southward, coming up to the grade of the existing Penn Central embankment.

A shield driven tunnel along Washington Street south of Dudley is considered undesirable due to the inability of the existing elevated Orange Line to withstand the potential settlement which generally accompanies this form of construction.

4.5.2.2 Ridership, User Benefit and Operating Costs

Ridership projections reveal that this alternative does not create an expanded market area of patrons as successfully as the Orange Line relocation alternative. When compared to the "no build" expected to board the subway in 1980. The expenditure necessary to attract these riders would be approximately \$370,000,000. User benefits, derived from travel time saved, would accrue to the subway alternative at the rate of \$3.4 million per year compared to \$4.8 million per year for the relocated Orange Line.

Operating and maintenance costs, however, would be lower by about \$2 million per year when compared to the no-build case. The alternate does not provide the close station spacing of the street level facility as requested at South End residents for Washington Street.

4.5.3 Arterial Street Decked over Rail/Transit (in the Depressed Alternative) (Roxbury Crossing to Jackson Square)

Placing of the Arterial Street directly over the rail/transit facilities, between Roxbury Crossing and Jackson Square, for the prime purpose of containing noise and increasing land parcels available for the Roxbury Community College site was investigated. This option proves to be undesirable due to several factors which include close proximity of Jackson Square and Roxbury Crossing Stations and the Crossing of Stoney Brook Culvert.

Due to the location of Stoney Brook in this area, large scale building construction is not contemplated on the land under existing Columbus Avenue. Therefore, the increase in parcel size made possible by a potential decked arterial, could not be used. A buffer zone or open space would, however, be feasible. The cost of the arterial street construction over the rail/transit increases substantially due to the structural deck required. In addition, the tunnel thereby created would be unable to allow passage of diesel powered locomotives without extensive ventilation.

With the rail-transit portion of the project depressed and Stoney Brook Culvert crossing that depression, station access would ideally be provided at existing street level. The cleared land in this segment is to the east of the Penn Central, therefore, dictating that the street should be built on the east side instead of over the transit. The close proximity of the Roxbury Crossing and Jackson Square stations, as well as the factors mentioned above, require that any decked street alternative curve sharply to align over the rails and

curve back again to by-pass the transit stations and thus allow station access at existing street level.

Partial decking of two lanes on the east isde of the alignment was also studied for the purpose of improving roadway geometry but found undesirable from a noise-impact standpoint in that it would serve to direct the sound westward, toward Parker Hill and the adjoining Bromley-Heath housing project.

Lowering the station entrances and mezzanines to improve street geometry would involve a further depression of the rail/transit facility, and the Stoney Brook Culvert by approximately 12 feet.

A longitudinal splitting of the street (northbound and southbound) with stations provided in the median would involve additional land takings to the west of Roxbury Crossing and Jackson Square Stations and would hamper joint development potential.

Although decking of the depressed rail/transit with the arterial street appears to be not practical, it should be pointed out that at Mission Hill and Bromley-Heath Housing Projects, structural decking for noise shielding purpose is proposed. Light structural decks over a short longitudinal distance are also feasible at station areas for the purpose of joint development and open space uses.

4.5.4 Arterial Segment# 3 (Jackson Square to Forest Hills) West of Depressed Rail

The combination of an arterial street located to the west of a depressed rail/transit facility does not provide many benefits to the area between Jackson Square and Forest Hills. Other alternatives studied present more benefits to this segment.

In general, the right-of-way required for arterial configurations located to the west of the Penn Central does not directly serve the larger industrial parcels located to the east thereby making those parcels less attractive for continued use or redevelopment. In fact, such as alignment would impact existing cleared land parcels, located to the west, in a manner which renders them less useable for residential-related or open-space development. The Arterial-West scheme would place the open space and playfields adjacent to the new street thereby presenting more hazard to children than the Arterial-East scheme. In addition, the street would be closer to a larger number of houses which are located on the westerly side of the railroad. While there are some houses on the east, there is a predominance of industrial buildings which would not be affected by the proximity of the arterial street and which would benefit from improved access.

Under the Arterial-West alternative approximately 62 percent of the arterial's western boundary touches or is near residential land uses. Under the Arterial-East alternative approximately 25 percent of the arterial's eastern boundary touches or is near residential land uses.

With regard to geometric design, this arterial configuration is also less desirable since it must cross over from east to west of the depressed Penn Central in the vicinity of Atherton Street, just south of Jackson Square, then back to the east side just north of Forest Hills. In an effort to reduce the length and depth of the bridge structures required for the crossovers (thereby also minimizing the depth of rail depression) reverse curvature would have to be introduced to the street geometry.

In general, existing ground is at higher elevations on the western side of the Penn Central embankment. Therefore, any rail depression located to the east would be at a lower final elevation when compared to a westerly alignment. If the ground water in this area is at a constant elevation, an easterly rail

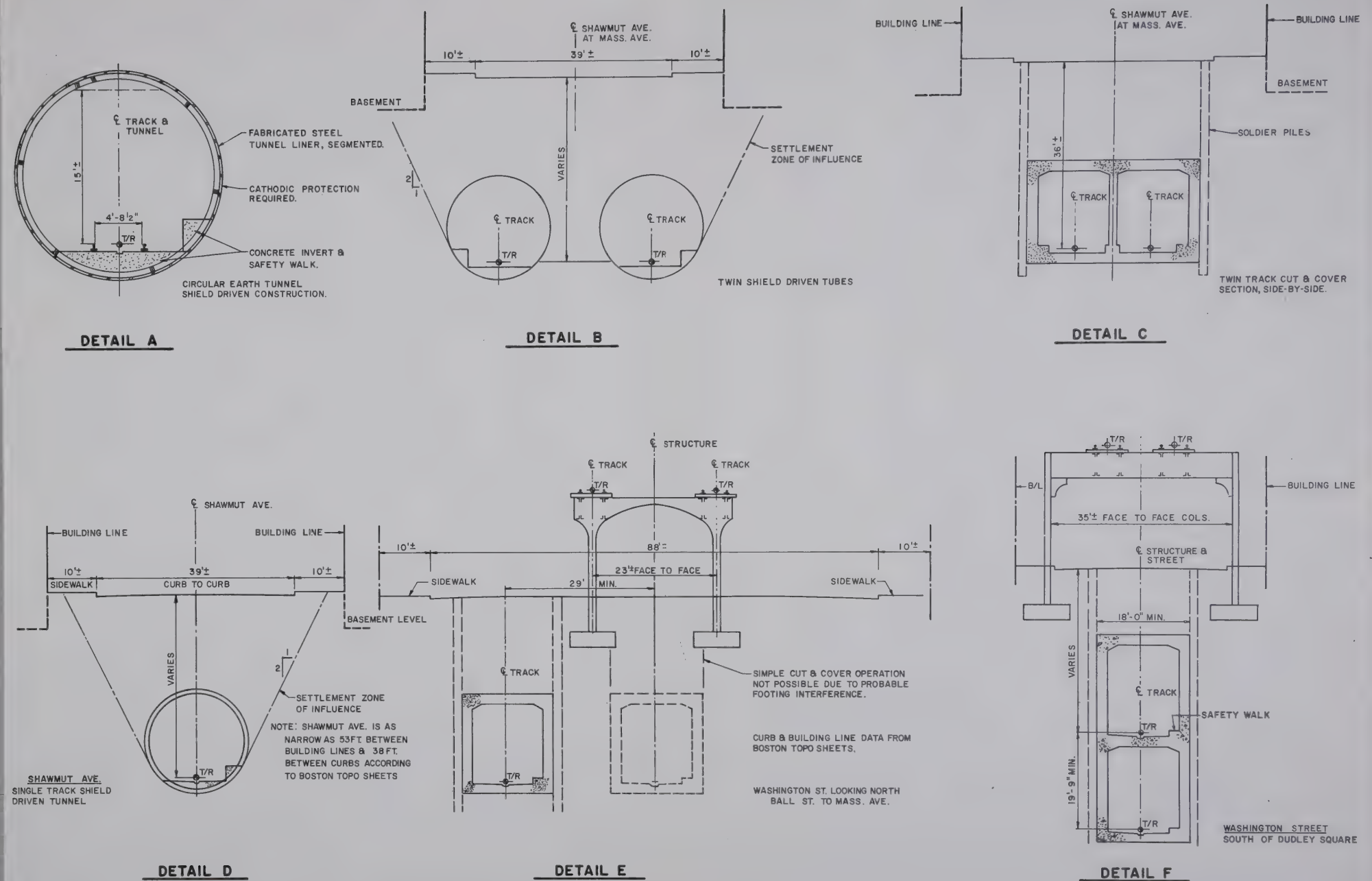
SOUTHWEST CORRIDOR TRANSPORTATION IMPROVEMENTS

ENVIRONMENTAL IMPACT ANALYSIS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION DETAILS

**WASHINGTON / SHAWMUT
ALIGNMENT**



NO SCALE

FIGURE
IV-99

EXPERIMENT 8 HAS IS NC

depression would be more costly to build since it would have to be built deeper in the ground water.

4.5.5 Orange Line in Tunnel from Back Bay Station to Camden Street

The feasibility of continuing the Orange Line tunnel alternative (SC-2) to the south of Back Bay station was investigated. An evaluation was made regarding the reduction in noise levels expected for such an undertaking as well as its construction implications.

4.5.5.1 Construction Considerations

In this option, the Orange Line would be placed in a twin concrete box structure approximately 20 to 21 feet below present rail grade. The structure would be built on the eastern edge of the present 66-foot wide right-of-way, leaving the present two westerly tracks for commuter rail and AMTRAK operations. The eastern side of the right-of-way has been selected for the tunnel structure way line. However, the eastern abutments of all street and foot bridges would have to be underpinned.

In the vicinity of Massachusetts Avenue the Orange Line alignment would cross over to the western side to join a proposed station located between Massachusetts Avenue and Gainsborough Street on the western side of the existing right-of-way.

Immediately south of Massachusetts Avenue station, which will be of the center platform type, the track alignment remains adjacent to the western right-of-way and rises to grade by means of a "U" shaped open-cut structure. Track alignment in the vicinity of Massachusetts Avenue would require the rebuilding of the western abutment and deck of this street crossing, as well as the taking of a building on the north west corner.

If the Penn Central is to remain operative during construction within the alignment, the tunnel structure itself can only be built, in the narrow 66-foot right-of-way, by leaving the sheet-pile excavation supports in place and pouring the concrete side walls against the piling. This method permits narrowing of the construction trench which enables use of two tracks uninterrupted. In addition to the steel sheet piling left in place, part of the bracing system will also have to be incorporated in the transit tunnel structure.

Incorporating these techniques, the clearance from the centerline of the closest operative rail to the sheet piling line is only 8 - 1/2 feet which is marginally acceptable. A greater side clearance would require that the twin-box structure be shifted partially into Claremont Street.

4.5.5.2 Noise Considerations

See Section 5.5.

4.5.6 Depressed and Covered Rail/Transit in South End (Back Bay Station to Camden Street) (See Fig. IV-100, IV-101)

The existing rail depression between Back Bay Station and Camden Street is presently between 8 and 20 feet below adjacent street grades, with the present track grade rising toward the south. In the St. Botolph neighborhood, 12 houses have first-floor windows which face directly into the western side of the track bed. Existing peak noise levels caused by diesel locomotives currently exceed 110 decibels (dB).

One alternative considered incorporates depression of the entire rail/transit facility and decking it over with a structure which allows diesel smoke to filter through. The depressed structure would cover the five-track right-of-

way but still allow light to the first floor windows of the row houses.

Noise considerations for this alternative is presented in Section 5.5.

4.5.6.1 Construction Considerations

In this option the Orange Line would be located on the western side of the right-of-way with AMTRAK and Commuter Rail (Railroad) retaining 3 tracks along the east. It is desired to place a noise suppressing structure over and around the proposed depressed five-track right-of-way, while providing a 17' - 9" structure clearance for the Railroad and not having the cover structure obstruct the window sill level of the houses mentioned above. These criteria can be satisfied by lowering the present track grade by approximately 9 feet in the vicinity of Massachusetts Avenue. Provisionally, this depth of cut has been maintained throughout the reach.

The 9-foot track depression requires that all houses on the western right-of-way line be supported. The support of these houses has been integrated with the support of the excavation cut by use of tied-back slurry walls. The walls would be excavated in 8-to-12-foot-long alternating sections on both sides of the proposed deepened cut. Initially, the west wall would be built, permitting the use of the two easterly tracks for railroad operations. In this case, the eastern most track, which is currently in disrepair, would have to be rehabilitated.

The deepening of the right-of-way would proceed in two stages, with the eastern half deepened first. The eastern face of the first-stage excavation would be supported by a steel-sheet pile wall, cross braced to the western slurry wall as excavation proceeded.

At the bottom of the excavation a track drainage system would be installed, topped by a substantial reinforced concrete base slab to resist uplift pressures. After the first half of the deepening has been completed the second or easterly part can proceed.

Since the slurry walls are 30 inches wide, a 3-foot strip of property to the east of the eastern right-of-way would have to be acquired permanently. For the main part, this taking is confined to the bed of Claremont Street which adjoins the western right-of-way line. Exceptions to this are the two building properties on either side of Massachusetts Avenue which will have to be acquired and demolished.

In addition, a 3-foot segment of Titus Sparrow Park would have to be acquired. This park is currently under construction. As such, it does not yet qualify as a 4 (f) property. A request has been made of the City of Boston through its Redevelopment Authority for a 4 ft. (plus construction) easement.

4.5.7 Rail Service Continued in Penn Central Corridor During Construction

4.5.7.1 Depressed Alternatives

Maintenance of commuter-rail service on the Penn Central Shore Line to Back Bay Station can be continued under certain circumstances while construction of the proposed new Orange Line progresses.

Two options were investigated. Option A: partial excavation of the present embankment while maintaining rail service on that portion of the railroad embankment that temporarily stays up. Option B: shifting railroad service to a temporary trestle constructed on that land scheduled to be used for Arterial Street purposes.

Operating the railroad on an adjacent temporary track at street level would be dangerous even though lights and gates were provided. In addition, existing utilities are at shallow depth and could not withstand rail traffic loadings. At crossings, these utilities would possibly

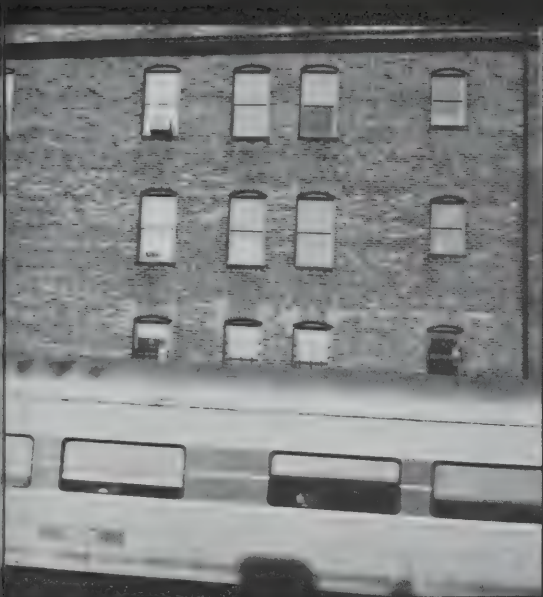


FIG. IV-100





FIG. IV-101

rupture. From a safety point of view alone, this choice was eliminated from further consideration.

Under "Option A", it would be necessary to drive a continuous wall of steel sheeting between the existing two center tracks. The sheeting would be of sufficient length to both support the present railroad embankment and permit partial excavation of the transit depression. Since the depression goes below the present groundwater table, extensive shoring and support of the sheeting is required so as to preserve the integrity of the embankment. Careful monitoring of the sheeting and shoring would be necessary during dewatering of the depression as this is the time when soil conditions are most subject to movement. Any movement would seriously endanger the embankment's capability to safely carry trains.

At all cross streets temporary bridges would be required to cross the first-stage excavation of the depression so that vehicular traffic remains undisturbed.

Construction staging of this sort would require that large pieces of construction equipment would have to work immediately adjacent to an operating railroad track. Construction equipment within 12 feet of a track (which will be necessary under this option) fouls the track and under railroad regulations, precludes passage of a train. Such a train cannot pass until such time as the construction equipment is moved away from the active track. This difficulty will cause the slowing of railroad trains to a restricted speed through the construction area as well as lengthen the construction time.

Upon completion of the first longitudinal depressed section of the facility, train traffic could be diverted to the depression and the process repeated for removing the remaining half of the embankment.

Such a construction staging program would add extensive time periods and extra cost to the total project as well as cause passenger railroad delays due to slower operating speeds. In addition, construction impacts would be more severe. Substantial problems relative to maintaining safe train operations and safe working conditions render this option marginally feasible.

"Option B", which would utilize the construction of a temporary two-track trestle for interim commuter rail operations, is the more viable option.

The construction of a temporary trestle would occupy the space presently intended for Arterial Street purposes. While such an option provides for safe train operations and safe working conditions, it also materially adds to the length of the total construction program. The temporary trestle would have to be constructed to accept diverted rail traffic during construction, then completely dismantled before the proposed arterial street can be built.

With either of the foregoing options, the constraints of constructing a new facility within the confines of Back Bay Station remains difficult. It presently appears likely that no more than one track could be maintained active in Back Bay Station area - and this track would require continual shifting to accommodate construction procedures. It is highly likely that Back Bay Station schedules, therefore, would have to be revised to fit into a single track operation. Patrons using Back Bay Station under such conditions would likely be subject to delays and would suffer inconveniences due to construction procedures.

Alternatives to continuing all service at Back Bay during the construction period include a partial diversion of at least AMTRAK service

and deadhead runs (empty trains in counter-peak direction) to the Penn Central Midland Division. This alternative would relieve the demand for the single track through Back Bay, the point of greatest construction. This would provide a single track in the peak direction with a probable capacity of a 10 minute headway, or 6 trains/hour. Some alternate routing of trains in a "non stop" to South Station mode is also possible, though this would reduce the service alternatives for Back Bay bound riders while increasing the ease of travel for South Station bound passengers.

The preliminary estimated cost for a temporary 2 track trestle is \$53,260,000 plus 30 percent for engineering and contingencies.

4.5.7.2 Embankment Alternatives

The raising of the present railroad embankment, while maintaining active rail operations on 2 tracks, can be accomplished in a reasonable manner for those areas between existing bridges that overpass streets. The difficulty comes about when 2 active tracks must be maintained on the present bridge structure while the remaining half of the bridge is demolished to permit construction of the new higher, wider and longer span bridge.

To accomplish such an operation would necessitate the driving of steel sheet piling adjacent to the 2 active tracks for a length in excess of the length of the proposed new rail/transit bridge. However, at the immediate existing bridge site it would not be possible to drive steel sheeting down through the present granite abutment to facilitate removal. Rather, the existing granite blocks would have to be carefully removed and the remaining portion of the abutment shored and braced in an effort to protect its structural integrity. Undoubtedly this would be a time consuming process and provide a less than desirable construction area for the first half of the new rail/transit bridge.

Should such a scheme be ultimately deemed desirable, an extensive evaluation of the condition of the existing railroad bridge will be necessary. It is not presently known whether or not the present steel spans are so constructed as to lend themselves to longitudinal separation of the midpoint. A total examination of the original steel design together with an analysis of present steel condition is required. Considering the age of the existing railroad bridges, their present condition may very well preclude partial dismantling to permit new staged construction.

A second option which is feasible for the embanked alternatives is the temporary 2 track trestle system which was described earlier.

.6 Relationship to Other Projects

Several other projects are under discussion for the Southwest Corridor, areas within the City of Boston, as well as suburban communities. A description and consideration of each is included below. The projects which are currently included in the Unified Work Program for the Boston Region, or are in design or construction are:

4.6.1 The Proposed Improvements to the Needham Branch Railroad

The proposed improvements to the Needham Branch railroad may take the form of new improved railroad commuter service or extension to the Orange Line transit system to Needham and route 128 respectively. Should the new service be commuter rail, the opportunity to negotiate an easy transfer to the Orange Line at Forest Hills will be provided as well as affecting an Orange Line transfer for continuation of an inner-city trip. Should the Needham Branch be converted to Orange Line service the capability will newly be provided for a single line trip from Route 128 Needham, to and through the City of Boston and on to the Oak Grove station on the recent Orange Line North extension at the Malden-Melrose Town Line. Heretofore, such a trip has never been possible. A transfer to the Green Line will be possible under all alternatives at Forest Hills.

4.6.2 The Proposed New High Speed Northeast Corridor Rail Service

The proposed new high speed Northeast Corridor rail service will terminate at South Station and other service to New York and Washington at Back Bay. The approved south cove tunnel extension project will when completed convey the train patron from South Station to North Station for a continuation of a railroad trip to the north. By virtue of the proposed Relocated Orange Line service, the high speed railroad patron will be able to disembark at Back Bay Station, utilize Orange Line Rapid Transit to locations within Roxbury and Jamaica Plain with only one transfer.

4.6.3 The Proposed Commuter Rail Upgrading

The proposed commuter rail upgrading will enable the railroad patron from the Franklin and Stoughton Branches to interface with proposed Orange Line Stations at Forest Hills, Ruggles/Northeastern and Back Bay. Forest Hills will provide the efficient transfer to either Orange Line or Green Line service. Ruggles/Northeastern station is located at the junction of possible future circumferential transit. Should this become a reality, the railroad patron will be afforded the opportunity to make a previously unavailable circumferential trip to the educational-hospital complex in Boston. Back Bay Station of course will permit the rail commuter to transfer to the Orange Line for an inner city trip or a make connection to North Station for an ongoing northerly railroad trip.

4.6.4 South End/Roxbury/Dorchester/Mattapan Transportation Improvements

The MBTA received proposals from consultants on November 6, 1975, for an investigation of project alternatives and production of Environmental Impact Analysis for improved reservation transit service for these communities.

4.6.5 Circumferential Transit

The Central Transportation Planning Staff (CTPS) is currently investigating alternatives for cross-town transportation in the institution-residential-industrial ring through Boston, Cambridge and Somerville in preparation for an Environmental Impact Analysis. The Southwest Corridor project provides right-of-way reservation for this project in Lower Roxbury.

4.6.6 Green Line Improvements

New equipment, station modernization, power and communications projects are at various stages of development. The present Orange Line/Green Line configuration at Forest Hills requires that a passenger transferring from one line to the other must disembark and walk through a heavily travelled, dangerous street complex to affect the transfer. The proposed Orange Line Relocation with

its new Forest Hills Station will relocate Green Line service to the proposed new Forest Hills Station. Such an arrangement will provide new under cover cross-platform service between the Orange Line and Green Line services.

The ability to relate the Green Line into the proposed new Forest Hills Station complex further provides the capability to make under-cover transfer to both the commuter train and bus thus reinforcing the area transportation network.

4.6.7 South Cove Transit Station and South Cove Tunnel Extension

A capital grant has been received by MBTA to complete the South Cove Station envelope tunnel and to provide service to Back Bay Station. The Orange Line can be fully relocated to the Penn Central corridor to provide the required interface for service to be extended from Back Bay to Forest Hills.

4.6.8 The Proposed Upgrading of the Midland Branch Railroad

The proposed upgrading of the Midland Branch Railroad has been approved for capital grant to the MBTA. It has an equally important long range relocation-ship in that the Midland Branch will be able to provide local railroad service and can act as a railroad relief valve during emergencies and peak periods on the mainline. The ability to deadhead trains back out to the suburbs during the in-bound peak will reduce rolling stock requirements and expand capacity. It is of vast importance in providing the capability to continue mainline rail service to Boston's South Station during the reconstruction of the Penn Central corridor.

4.6.9 New Orange Line Cars

Capital Grant has been recieved by the MBTA for the purchase of additional cars for the Orange Line.

4.6.10 Orange Line North

Service as initiated in 1975 on the new alignment for Haymarket Station to Malden Center with intermediate stations at Community College, Sullivan Square and Wellington. Further extension to the Oak Grove Station, near the Malden-Melrose Line, will be completed in 1976.

4.6.11 Other Related Transit Improvements

Other related transit improvements, such as the Arborway Bus Garage and operating improvements are described in the Transit Development Plan of the MBTA.

